MARINE REVIEW.

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ANNUAL REPORT OF SHIP BUILDING.

$25,087,942 IS THE VALUE OF NEW SHIPS BUILDING IN THE UNITED STATES—NEW TONNAGE BUILDING ON THE LAKES, $2,898,000—MERCHANT WORK IN COAST AND RIVER SHIP YARDS, $2,417,600—U. S. NAVAL WORK, $16,772,342.—TWO MODERN CRUISERS FOR JAPAN, $3,000,000. COAST MERCHANT WORK IS A LITTLE OVER A THIRD WHAT IT WAS LAST YEAR AND LAKE YARDS HAVE ONLY A THIRD AS MUCH, BUT NAVAL WORK AMOUNTS TO OVER $2,000,000 MORE.—THE BUILDING OF WAR SHIPS FOR FOREIGN GOVERNMENTS A NEW DEPARTURE FOR AMERICAN SHIP YARDS.

The Marine Review's annual report of ship building in the United States shows the effects of the financial uncertainty of the past year. Dec. 31, 1895 there was $8,549,000 worth of new tonnage in lake ship yards, as shown by a table on page 9. The Bessemer fleet represented $2,520,000 of this, so that taking out this unusual order, the value of tonnage building is about half what it was a year ago, and practically the same as in 1893 and 1894. There are fourteen large steel vessels among the thirty-one under construction, seven steamers and seven schooners or barges. The building of the schooners and the increased draft to be available next season will make the capacity fully half as much as that of the vessels building a year ago. The building of wooden steamers or barges of any size is now confined to one yard, that of James Davidson, West Bay City, Mich. Last year five yards were engaged in this work. In 1895 F. W. Wheeler & Co., West Bay City, Mich., led in the capacity and value of tonnage under construction, and this year the Chicago Ship Building Co., takes the first place with tonnage having capacity for nearly 20,000 tons and a valuation of three quarters of a million dollars.

In coast and river yards there are 65 merchant craft of all kinds under constrution, having a valuation of $2,417,600 as against $6,577,650 a year ago. At that time there were building three passenger steamers valued at nearly $2,000,000. Taking this into consideration the decrease in coast building is about the same as on the lakes. The only merchant vessels of importance in coast yards are a passenger steamer for the Old Dominion line building at Chester, Pa., and a freight steamer for the Merhants' & Miners' line and a steam yacht building by Harlan & Hollingsworth, Wilmington, Del.

Although the total amount of U.S. naval work under construction is only $16,772,342, about three quarters of a million less than a year ago, it is more satisfactory to coast builders, for owing to the construction of eighteen torpedo boats it has been distributed to a much larger number of ship yards. Last year six ship yards had naval work and this year it is found in twelve yards. The most satisfactory feature of the ship building industry in this country was the signing of contracts by representatives of the Japanese government in Washington, Dec. 31, with the Wm. Cramp & Sons Ship and Engine Building Co., and the Union Iron Works, for two modern and formidable cruisers to cost $1,500,000 each. Particulars may be found in the tabulated report of naval work on the following pages.

We are indebted for this information to lake and coast ship builders who have come to recognize this report as valuable and interesting, and the response to inquiries was prompt and complete so that this can be considered a full report of all ship building in the United States. The Review enjoys the distinction of being the only marine paper in the United States that has been able to present such a report.

Ships Building and Under Contract in Lake Ship Yards, Dec. 31, 1896.

Builders.	Class.	Dimensions.	Capacity. Gross Tons. 16 feet draft.	Value.	For Whom Building.
Chicago Ship Building Co., Chicago, Ill.....	Steel freight steamer.....	426-406-48-28	5,000	$240,000	A. B. Wolvin, Duluth, Minn.
Chicago Ship Building Co., Chicago, Ill.....	Steel freight steamer.....	254½-238-42-26	2,500	125,000	R. R. Rhodes, Cleveland, O.
Chicago Ship Building Co., Chicago, Ill.....	Steel freight steamer.....	254½-238-42-26	2,500	125,000	R. R. Rhodes, Cleveland, O.
Chicago Ship Building Co., Chicago, Ill.....	Steel tow barge.....	366-352-44-26	4 600	130.000	C. W. Elphicke & Orr, Chicago, Ill.
Chicago Ship Building Co., Chicago, Ill.....	Steel tow barge.....	390-376-46-26	5,200	150,000	James Corrigan, Cleveland, O.
Cleveland Ship Building Co., Cleveland, O....	Steel freight steamer.....	420-400-48-28	4,650	235,000	Capt. Thomas Wilson, Cleveland, O.
Cleveland Ship Building Co., Cleveland, O....	Steel freight steamer.....	426-406-48-28	4,790	240,000	A. B. Wolvin, Duluth, Minn.
Globe Iron Works Co., Cleveland, O.....	Steel tow barge.....	388-376-46-26	5,000	150,000	James Corrigan, Cleveland, O.
Globe Iron Works Co., Cleveland, O.....	Steel tow barge.....	378-366-44-26	4,720	130,000	Bessemer Steamship Co., Cleveland, O.
Globe Iron Works Co., Cleveland, O.....	Steel tow barge.....	378-366-44-26	4,720	130,000	Geo. E. Tener, Pittsburg, Pa.
Union Dry Dock Co., Buffalo, N. Y.....	Steel freight steamer.....	346-325-44-28	4,000	220,000	Union Steamboat Co., Buffalo, N. Y.
Union Dry Dock Co., Buffalo, N. Y.....	Steel oil barge.....	254-40-23	750,000 gals	125,000	Standard Oil Co., New York, N. Y.
James Davidson, West Bay City, Mich.....	Wooden freight steamer....	235-41-17	2,000	75,000	James Davidson, West Bay City, Mich.
James Davidson, West Bay City, Mich.....	Wooden tow barge.....	300-45-24	3,500	90,000	James Davidson, West Bay City, Mich.
James Davidson, West Bay City, Mich.....	Wooden tow barge.....	300-45-24	3,500	90,000	James Davidson, West Bay City, Mich.
James Davidson, West Bay City, Mich.....	Wooden tug	80-20-11½	.....	15,000	Independent Tug Line, Chicago, Ill.
American Steel Barge Co., W. Superior, Wis...	Steel tow barge.....	380-44-26	4,900	130,000	Inter-Lake Transit Co., Cleveland, O.
F. W. Wheeler & Co., West Bay City, Mich...	Steel steamer.....	281-266-42-19	3,100	120,000	J. L. Crosthwaite, Buffalo, N. Y.
F. W. Wheeler & Co., West Bay City, Mich...	Steel tow barge.....	378-366-44½-26	4,575	130,000	Bessemer Steamship Co., Cleveland, O.
Bertram Engine Works Co., Toronto, Ont.....	Twin-screw pass. steamer..	126-118-30- 9	.....	50,000	Lake-of-the-Woods & Rat Portage Line
Bertram Engine Works Co., Toronto, Ont.....	Four tow barges.....	134-130-27-11½	.....	80,000	Prescott Elevator Co., Prescott, Ont.
Calvin Company, Garden Island, Ont.....	Wooden steam barge.....	215-200-37-15	60,000 bu.	80,000	Calvin Co., Forwarders, Garden Island.
Alex. Anderson, Marine City, Mich....	Two barges.....	130-34-12	.....	10,000	Breyman Bros., Toledo, O.
Bell's Steam Engine Works, Buffalo, N. Y.....	Two steel steam yachts.....	54-50-10 and 50-46- 8	.....	7,000	Builder's Account.
E. W. Heath, Benton Harbor, Mich.....	Tug, wooden.....	85-20-11	.....	17,000	Lydon & Drews Dredging Co., Chicago.
E. W. Heath, Benton Harbor, Mich.....	Steam yacht.....	50-8½-6	.....	4,000	H. B. Larson, Manistee, Mich.
			69,255	$2,898,000	

NAVAL AND GOVERNMENT WORK IN COAST SHIP YARDS.

NEWPORT NEWS SHIP BUILDING AND DRY DOCK CO., 1 BROADWAY, NEW YORK, N. Y. AND NEWPORT NEWS, VA.

		Length, water line.	Beam.	Draft.	Disp.	Cost of hull and machinery.
Battleship	Kearsarge	368	72-5	23½	11,525	$2.225 000
"	Kentucky	368	72-5	23½	11,525	2,225,000
"	Illinois	368	72-5	23½	11,525	2,595,000
Gunboat	Nashville	220	38-3	11	1,371	280,000
"	Wilmington	250-9	40 1	9	1,313	280,000
"	Helena	250-9	40-1	9	1,313	280,000

THE WM. CRAMP & SONS SHIP & ENGINE BUILDING CO., PHILADELPHIA, PA.

Battleship	Alabama	368	72-5	23½	11,525	$2 650,000
"	Iowa	360	72	24	11,300	*3,010,000
Japanese Cruiser		374	48	30	4,760	1,500,000

LEWIS NIXON, CRESCENT SHIP YARD, ELIZABETHPORT, N. J.

Composite gunboat	Annapolis	168	36	12	1,000	$227,000
Light-house tender		....	...	...	800	73,000

BATH IRON WORKS, BATH, ME.

Composite gunboat	Vicksburg	168	36	12	1,000	$229,400
" "	Newport	168	36	12	1,000	229,400
Torpedo boats 9 and 10		147	16-4½	4-7½	146	388,000

J. H. DIALOGUE & SON, CAMDEN, N. J.

Composite gunboat	Princeton	168	36	12	1,000	$230,000

THE ATLANTIC IRON WORKS, EAST BOSTON, MASS.

Composite revenue cutter	Manning	205	32-10	17	.....	200,000

UNION IRON WORKS, SAN FRANCISCO, CAL.

Battleship	Wisconsin	368	72-5	23½	11,525	$2,674,950
Composite gunboat	Wheeling	174	34	12	1,000	219.000
" "	Marietta	174	34	12	1,000	223,000
Torpedo boat No. 11		210	20-4	6	273	227,500
Japanese Cruiser		374	48	30	4,760	1,500,000

COLUMBIAN IRON WORKS, BALTIMORE, MD.

Torpedo boats Nos. 3, 4 and 5		160	16	5	142	$292,500
Sub-marine boat		84	11½	...	168	150.000
Torpedo boat No. 18		101½	12½	4-3	65	45,000

HERRESHOFF MFG. CO., BRISTOL, R. I.

Torpedo boats Nos. 6 and 7		175	17	5½	150	$294,000
" "	No. 14	147	15½	4½	103	85,000
" "	Nos. 15 and 16	100	12½	3½	46½	78,000

MORAN BROS. CO., SEATTLE, WASH.

Torpedo boat No. 8		170	17	5½	182	$160,000

WOLF & ZWICKER, PORTLAND, ORE.

Torpedo boats Nos. 12 and 13		146	15-3½	5-4	128	163,092

CHAS. HILLMAN SHIP & ENGINE BUILDING CO., PHILADELPHIA, PA.

Torpedo boat No. 17		101½	12½	4-3	65	48,500

*Nearly completed--not included in totals.

MERCHANT WORK IN COAST SHIP YARDS.

ARTHUR D. STORY, ESSEX, MASS.

Schooner	92 21	9	$ 7,000	J. W. Munn & Co., Galveston Tex.
"	90 22	8¾	7,000	Builder's account.

THE CHARLES HILLMAN SHIP & ENGINE BLDG. CO., PHILADELPHIA, PA.

Steel steamer	115	23½ 6½	$ 80,000	G. F. Brady & Bro., Middletown, Del

LEWIS NIXON, CRESCENT SHIP YARD, ELIZABETH, N. J.

Steel steamer Cinderella	166 tons	$ 38,000	City of New York.
Steel oil barge Jas. W. Lee,	275 tons	19,000	Pure Oil Co., New York.
Holland sub-marine boat,		75,000†	

HARLAN & HOLLINGSWORTH CO., WILMINGTON, DEL.

Sea going tug Catawissa	170 29 18	$ 75,000†	Phila. & Reading R. R. Co., Phila. Pa
Ferry boat	205 65 14½	120,000†	West Shore R. R. Co., New York.
Steam pilot boat	155 24 19¾	60,000†	N. Y. & N. J. Sandy Hook Pilots' Ass.
Steamship	293½ 42 34	200,000†	Merchants' & Miners' Trans. Co.
Staam yacht	174⅔ 24 14¾	150,000	Geo. W. Childs Drexel, Phila. Pa.

NEAFIE & LEVY SHIP & ENGINE BUILDING CO., PHILADELPHIA, PA.

Passenger steamer	150 35 11	$60,000	Winthrop Steamboat Co., Portland, Me.
Steam pilot boat	135 25 14½	50,000	Penn & Delaware Pilot's Association.

DELAWARE RIVER IRON SHIP BUILDING & ENGINE WORKS (ROACH'S SHIP YARD,) CHESTER, PA.

Steamship No. 291	304 42 27	$350,000	Old Dominion St'mship Co., New York, N.Y

†Estimated.

THE PUSEY & JONES CO., WILMINGTON, DEL.

Iron sidewheel	131 25 5⅔	$60,000†	C. G. Pinedo, Maracaibo, Venezuela.	
passenger and freight steamer Mara.				

COLUMBIAN IRON WORKS & DRY DOCK CO., BALTIMORE, MD.

Submarine boat	38 9	$80,000	Lake Sub-marine Co., Baltimore, Md.

JACKSON & SHARP CO., WILMINGTON, DEL.

Freight steamer	150 26 10	$35,000	Commonwealth Trans, Co., Phila., Pa.
Ferry Steamer	150 52 32 12	40,000	Riverside & Fort Lee Ferry Co., New York

T. S. MARVEL & CO., NEWBURGH, N. Y.

Steam tug	90 22 10½	$ 25,000	Tide Water Oil Co., New York.
Steel steam yacht	125 30 10¼	40,000	H. C. Wintringham, New York.
" " "	90 14 9¼	19,000	Gardner & Cox, 1 Broadway, New York.
" " "	130 18 10	38,000	" " "
Barge	110 32 9	7,500	Brockaway Brick Co.
Pontoon	34 24 9	2,500	West Shore R. R. Co., New York

CHARLES L. SEABURY & CO., NEW YORK, 50 BROADWAY, AND GAS ENGINE AND POWER CO., MORRIS HEIGHTS, NEW YORK.

Steel st'm y'ht Hiawatha,	170 21 8	$ 90,000	Chas. Fleischmann.
" " " Raynham	85 13 5	25,000	E. S. Woodward.
" " " Punjab	85 13 5	25,000	F. L M. Masury.
Twin-screw naphtha y'ht,		9,000	U. S. Light-house Dept.
Naphtha yacht		3,000	Health Dept., New York.

THE ROBT. PALMER & SON SHIP BUILDING AND MARINE RY. CO., NOANK, CONN.

Railroad float	135 35 10	$ 15,000	Lowell M. Palmer, New York, N. Y.
" "	135 35 10	15,000	C. R. R. of N. J., Jersey City, N. J.
Four railroad floats	135 35 10	60,000	Brooklyn, N. Y. Wharf & Warehouse Co

NATHANIEL T. PALMER, BATH ME.

Four masted schooner	260 43 21	$ 80,000	Builders' account.

BANNON & SUTHERLAND, GRASSY POINT, N. Y.

Sloop yacht	53 38 16 3⅜	$3,000	Builder's account.

J. S. ELLIS & SON, TOTTENVILLE, N. Y.

Tug boat	65 16 6½	$ 9,000	Robert White, Brooklyn, N. Y.
Steam barge	110 25 7½	15,000	John Worth, Brooklyn, N. Y.

SAWYER BROS., MILLBRIDGE, ME.

Three masted schooner	112 32 10	$ 17,000	For sale.

W. IRVING ADAMS, E. BOOTHBAY, ME.

Steamer	70 18 8	$ 10,000	F. W. Collins, Rockland, Me.

S. W. SKINNER, WILMINGTON, N. C,

Three-car floats	150 33 8	$ 6,000	Cape Fear R. R., Wilmington, N. C.
Four scows	100 24 10	5,000	Verginia Dredging Co., Richmond, Va.

FILLMORE A. BAKER, PATCHOGUE, L. I.

Sloop yacht	40 13 4	$ 1,200	J. B. Cook, Westhampton, L. I.
Steam yacht	50 14 4	2,000	For sale.

W. M. TEBO, FOOT 23D ST,, BROOKLYN, N. Y.

Sloop yacht	37 8 4	$ 2,000	Jno. Shea, Brooklyn, N. Y.

RICE BROS., E. BOOTHBAY, ME.

Schooner yacht	60 13½ 8½	$ 5,400	For builders.
Sloop yacht	49 13 7½	3,000	E. W. Presbry, New York.
" "	30 10 5	800	L. E. Stanley, Bar Harbor, Me.

WM. H. BIRCH & CO., 129 to 135 FIRST ST., SAN FRANCISCO, CAL.

Steamer Hume	37 9 4	$ 3,500	J. Hume Packing Co., Alaska.
Tender Madrona	32 8 3	2,500	U. S. Light-house Dept., San Francisco.
Tenders Corwin & Perry	26 6 2	2,600	U. S. Revenue Service, " "
Tug Golden Gate	80 18 7	15,000	Artic Oil Works, San Francisco, Cal.

DAVID S. BARMORE, MADISON MARINE WAYS, MADISON, IND.

Towing steamer	200 35	6½	$ 55,000	St. Louis & Miss. Val. Trans. Co.,

E. J. HOWARD BOAT YARDS, JEFFERSONVILLE, IND.

Stern wheel steamer	225 42	$ 60,000	St. Louis & New Orleans Anchor Line.

GODFREY MARINE WAYS CO., LYONS, IA.

Passenger steamer	165 30	$ 25,000	W. J. Young & Co.

A. AXTON & SON, WEST BROWNSVILLE, PA.

Tow boat Harry Brown	205 35	5½	$ 75,000	W. H. Brown & Sons, Pittsburgh, Pa.

MATHER & WOOD, PORT JEFFERSON, N. Y.

Steamer	150 25	10½	$ 60,000	Port Jefferson Steamboat Co.

J. H. DIALOGUE & SON, CAMDEN, N. J.

Steamer No. 347	150 26 17	$ 80,000	Stock account.

McCAUSLAND & CO., RONDOUT, N. Y.

Barge	100 30 12	$ 4,000	Albany Day Line.

†Estimated.

LAKE SHIP AND ENGINE BUILDING NOTES.

VESSELS UNDER CONTRACT IN LAKE SHIP YARDS EACH YEAR FOR TEN YEARS PAST.

December 31.	Number of vessels.	Capacity, gross tons.	Valuation.
1886	31	65,750	$4,074,000
1887	60	108,525	8,325,000
1888	59	100,950	7,124,000
1889	56	124,750	7,866,000
1890	38	77,950	5,337,000
1891	45	76,000	4,896,000
1892	49	68,470	6,909,500
1893	28	26,400	2,538,500
1894	29	33,150	2,932,500
1895	65	136,600	8,549,000
1896	31	69,255	2,898,000

Alex. Anderson, Marine City, Mich., is rebuilding the schooner George Nestor and two tugs.

A. Abbey Port Dalhousie, Ont., is building a tug for Duncan Armstrong, of the same place.

The Bertram Engine Works Co., Toronto, Ont., is building two compound engines, 10 and 22 by 14 inches.

M. P. Lester, Marine City, is rebuilding the steamer Mark Hopkins, and will add new auxilliary machinery.

The Union Dry Dock Co., Buffalo, N. Y., will construct a new 500-foot dock and will be in the market for pumping engines, machinery, etc.

E. W. Heath, Benton Harbor, Mich., will put a Roberts boiler into the wooden steam yacht he is building for H. B. Larson, Manistee, Mich.

Drake and Wallace, St. Joseph, Mich., are building a $10,000 river steamer, 80 feet long, the engines for which will be taken from another steamer.

Engines for the new steamer building at Buffalo, will be 22, 38 and 64 by 42 inches, and the four boilers 11½ by 12 feet, allowed 175 pounds pressure.

Engines for the steamer buiding by F. W. Wheeler & Co., W. Bay City, Mich., will be 17, 28 and 47 by 36 inches, and the two boilers will be 11 by 12 feet.

Burger & Burger, Manitowoc, Wis., are rebuilding for the Goodrich Transportation Co. the steamer Muskegon which was wrecked in the Milwaukee dry dock.

The Ship Owners' Dry Dock Co., Cleveland, will rebuild the steamer Wallula, which was partially burned at Fairport this fall. The repairs will amount to nearly $25,000.

There will be three boilers 12 by 12 feet long in the Wilson steamer building at the Cleveland Ship Building Co.s' yard, to furnish steam for the triple expansion engines 23, 38 and 63 by 40 inches stroke.

In addition to the steamer and two schooners, James Davidson, West Bay City, Mich., is completing two large tugs, 99 by 20 by 10 feet, having compound engines 16 and 30 inches by 30 inches stroke.

The Milwaukee Dry Dock Co., Milwaukee, Wis., will enlarge one of their docks 77 feet so that vessels of 400 feet keel may be accommodated. They will also add a plant that will enable them to repair steel vessels.

The Calvin Company, Garden Island, Ont., will build the triple expansion engines for their new grain steamer. They will be 16, 24 and 38 inches, by 24 inches, and steam will be furnished by a 12½-foot Scotch boiler. John Mullin is foreman of the engine shop and Thomas Brian foreman of the ship yard.

The steamer Crescent City building by the Chicago Ship Building Co., for the Zenith Transit Co., will have quadruple engines, 19, 28, 41 and 60 inches by 42 inches stroke. Steam is to be furnished by two Babcock & Wilcox boilers. The quadruple engines in the Northern line passenger steamers are 25, 36, 51½ and 74 by 42 inches stroke.

When the Globe Iron Works Co. of Cleveland began arrangements some time ago for the construction of three large steel towbarges it was announced that one of the vessels was for Mr. John D. Rockefeller, another for Mr. James Corrigan of Cleveland and the third on builders' account. It was understood, however, that the third vessel was for G. E. Tener of Pittsburg. Both parites to the contract were desirous of keeping the matter quiet, but Mr. Tener's interest in the vessel is now publicly given out. He is the leading spirit in companies operating the Fairport docks and the steamers Nimick and Harper, as well as the steel tow barge Tyrone, which latter vessel was also built by the Globe company.

Although nothing may come of it lake ship builders are figuring on a number of new contracts. The Northern Steamship Co., asked for prices not long since on two new steamers. The Maytham interests of Buffalo and O. W. Blodgett, Bay City, are each said to be considering seriously the matter of building. It was announced that the Richelieu & Ontario Navigation Co., would have two large steamers built. It is not generally known but a number of Canadian capitalists have their eye on the St. Lawrence route, and several years ago got a special privilege from the government pertaining to it. G. Hurson, Milwaukee, Wis., wanted very much to add two new steamers to his Milwaukee-Chicago line. Financial conditions was all that prevented the C. & B. line, from placing an order for new passenger steamer, but they will very probably conclude arrangements during the summer.

LAKE SHIP YARDS REPORTING NOTHING BUILDING.

Milwaukee Dry Dock Co., Milwaukee, Wis.
Montreal Trans. Co., Kingston, Ont.
Morley & Hill, Marine City, Mich.
Hamilton Bridge Works Co., Limited, Hamilton, Can.
Wm. Dulac, Mt. Clemens, Mich.
Curtis & Brainard, Marine City, Mich.
R. W. Linn, Gibraltar, Mich.
Burger & Burger, Manitowoc, Wis.
Rieboldt & Wolter, Sturgeon Bay, Wis.

COAST SHIP BUILDING NOTES.

Capt. Kemps, New Berlin, Fla., is building a small propeller.

Quincy (Ia.) Marine Ways, will build a $10,000 ferry boat.

Wall & Bullard, Myrtle Point, Ore., are building a small steamer.

Stillman Saunders, Saunderstown, R. I., is building six cat boats.

Wentworth Allen, Athens, N. Y., is said to be building a small passenger steamer.

T. G. Sherwood, Davenport, Ia., is building a small steamer for the Hennepin canal.

Diamond Jo line is putting a new cabin on the Pittsburg at their Dubuque, Ia., ship yard.

Springfield Boiler Works will build at Alton, Ill., two $100,000 dredges for the government.

Geo. Lawley & Son Corp'n Boston, Mass., is building several small yachts under five tons.

O. H. Perry, 230 State street, Boston, Mass., is building an 80-foot steam yacht in East Boston.

Robert Palmer & Sons, Noank, Conn. are buildng a new hull for the Erie ferry boat, Susquehanna.

L. J. Wing, Liberty street, New York, has organized the New York Yacht Launch and Engine Co.

The New England Co., Bath, Me., are said to have on the stocks a passenger steamer 210 by 40 by 13 feet.

John Bishop, Gloucester, Mass., is building a pilot boat, 101 by 23, by 10½ feet for the Boston Pilot Association.

Repairs amounting to $35,000 are being made on river steamers at the yard of David S. Barmore, Madison Ind.

In addition to work on hand at the Godfrey Marine Ways, Lyons, Ia., the steamer Artemus Gates was built recently.

James H. Paine & Son, Boston, Mass., will build engines for the steamer building by W. I. Adams, E. Boothbay, Me.

R. M. Spedden Co., Baltimore, Md., will build a steamer 95 by 19 feet for the United States engineers. The cost will be about $60,000.

After completing three-tenths of a $70,000 light-ship, J. F. Steffen, Portland, Ore., has given up the contract and it will be re-advertised.

Peter L. Colon, Communipaw, N. J., will build a tug, 107½ by 23 by 10 feet costing about $20,000 for Brown & Fleming, New York.

At the government navy yard, Norfolk, Va., a tug, 225 tons, is

building for League Island service and the tug Fortune is being rebuilt

Chas. L. Seabury & Co., and the Gas Engine and Power Co., have $15,000 worth of repair work in their works at Morris Heigths, New York.

J. N. Robins, Erie Basin, So. Brooklyn, N. Y., will build for Harrison B. Moore, a steam yacht 172½ feet over all, 140 feet water line and 18 feet beam.

Bannon & Sutherland, Grassy Point, N. Y. , are putting an extensive rebuild on the yacht Annita, owned by the general manager of the Pennsylvania railroad.

Iowa Iron Works, Dubuque, Ia., will build a steel ferry boat for the Memphis Ferry Co., Memphis, Tenn., 135 feet long and 30 feet beam, costing about $35,000.

Robt. White, Brooklyn, N.Y., and S. B. Greason, Perth Amboy, N. J., are buildng engines for the tug and steamer building at the Ellis yard, Tottenville, N. Y.

It is reported that Howard will build at Jeffersonville, Ind., in addition to the Anchor line boat there, a tow boat for the Dolphin Transportation Co., St. Louis, Mo. She will be 155 feet long 32 feet beam, and will cost about $45,000.

Hugh Ramsay, Perth Amboy, N. J., has an order to build a dredge, a tug boat and scows in San Domingo, and will build at Perth Amboy three steel hopper dredges, one 120-foot steel tug and a launch for the Argentine Republic.

The Chesapeake and Ohio railroad will have a 100-foot wooden tug built by the Jackson & Sharp Co., Wilmington, Del. She will be a duplicate of the Montauk, built at the same yard for the Long Island Railroad, and will have a Neafie & Levy compound engine 20x36x26, with a Scotch boiler 11½x11½ to work 125 lb. steam.

Messrs H. & A. Allan, managers of the Allan line of steamships, have let a contract to a Belfast firm for a 10,000 ton freight, steamer and the contracts for two other vessels will be placed later. The new vessel will be 470 feet long, 54 feet beam, and will have a depth of 36 feet 6 inches. She will be completed in December 1897, and will be seen in the St. Lawrence river in the spring of 1898.

It is understood that the Japanese government will have built in England, for the purpose of comparison, a cruiser similar to the two for which the Cramps and the Union Iron Works recently obtained contracts. It is not probable that the United States builders have anything to fear as regards workmanship in these vessels. Plates for one of the vessels to be built here will be furnished by the Bethlehem Iron Works.

C. D. Mosher, 1 Broadway, New York, N. Y., has five steam yachts under construction, all to be of unusually high speed. One is for F. P. Magoun and one for J. A. Mollenhauer. Following are the lengths: one 75-foot, two of 80 feet, one 122 feet and one 200 feet long. Mr. Mosher says that although he expects to get all the way from 20 to 30 knots an hour out of these craft that there is no secret in their construction, and that he has given them the power necessary to drive them at the required speed. The engine bearings are unusually heavy. They will of course be fitted with the Mosher boiler, but as this boiler is specified for six of the new government torpedo boats there is no experiment in that.

COAST YARDS REPORTING NOTHING BUILDING.

Gulf of Mexico Marine Railway Co. Pensacola, Fla.
Maryland Steel Co., Sparrow's Point, Md.
H. Fordham & Sons, Grenport, L. I., N. Y.
Calais Dry Dock Co., Calais, Me.
C. C. Davidson, Milton, Del.
Ollinger & Bruce Dry Dock Co. Mobile, Ala.
John Englis & Sons, Greenpoint, Brooklyn, N. Y.
Divine Burtis, Jr., Ft. Conover street, Brooklyn, N. Y.
C. W. Booth, Rockport, Texas.
Matthew Turner, 40 California street, San Francisco, Cal.
Byron Jackson, Sixth street, San Francisco, Cal.
Clay Johnson, Kissimee, Fla.
C. W. Jacobson & Co., Savannah, Ga.
Morse Bros., Bath, Me.
C. Gifford, Vineyard Haven, Mass.
A. & M. Gammage & Co., So. Bristol, Me.
Hartford & New York Trans. Co., Hartford, Conn.
Portland Steamship Co., Portland, Me.
Isaac Coombs, Camden, Me.
Pope, Harris & Co., East Machias, Me.
Kelley, Spear & Co., Bath, Me.
S. Gildersleeve & Son, Gildersleeve, Conn.
David M. Nichols, New York, N. Y.
Valk & Murdock Iron Works, Charleton, S. C.
Robert Crosbie & Son, E. Boston, Mass.
G. E. Currier, Newburyport, Mass.
C. Morton Stewart & Co., Baltimore, Md.
John P. Smith, Nyack, N. Y.
Lcokood Mfg. Co., E. Boston, Mass.
Aaron McMullen, Rondout, N. Y.
M. G. Knox & Son, Marietta, O.
L. Wright, Jr., Newark, N. J.
O. W. Woostall, Millville, N. J.
East Boston Dry Dock Co., E. Boston, Mass.
Mississippi Valley Marine Ry. & Dock Co., Mound City, Ill.
Tietjen & Lang Dry Dock Co., Hoboken, N. J.
T. J. Southard & Son, Richmond, Me.
E. S. Crosby, Bath, Me.
International Steamship Co., Portland, Me.
M. A. Sweeney & Co., Jeffersonville, Ind.
I. L. Snow & Co., Rockland, Me.
Cobb, Butler & Co.,Rockland, Me.
G. G. Deering, Bath, Me.
Merrill-Stevens Engineering Co., Jacksonville, Fla.
Oregon Railway and Nav. Co., Portland, Ore.
McDonald & Brown, Belfast, Me.

Japanese Naval Program.

The orders for two cruisers given to the Cramps and the Union Iron Works by the Japanese government are only a small part of a scheme that will give Japan a navy that will rank well with the principal nations of the world. The outlay for 1896 will be $6,782.812.

The scheme is one of vast proportions and is divided into two programs. The appropriations in this year's budget provide for the first program, which is to be completed in seven years, and which includes 54 vessels with a total displacement of 45,890 tons. The second program is to be completed by April, 1906, and includes 63 vessels with a total displacement of 69,895 tons. The total increase in the navy will thus be 117 vessels, with a total displacement of 115,785 tons. The battleships Fuji and Yashima, building in England, and those vessels now building in Japan, are not included in the program. The following table gives the types of vessels to be built and the number to be built in Japan and abroad, as well as the displacement.

	Displacement.	First Program.	Second Program.	To be built in Japan.	Abroad	Total.
Battleships, Majestic type	15,140	1	3	1	3	4
First-class cruisers, Edgar type	7,500	2	2	2	2	4
Second-class cruisers, Yoshino type	4,850	3	.....	2	1	3
Third-class cruisers	3,200	.....	2	2	.....	2
Torpedo vessels	1,200	1	2	2	1	3
Torpedo supply ves. (Vulcan type)	1,450	.....	1	.....	1	1
First-class torpedo boats (large)	255	8	3	7	4	11
First-class torpedo boats	120	5	18	19	4	23
Second-class torpedo boats	80	28	3	.....	.....	31
Third-class torpedo boats	54	6	29	35	.....	35
Total	.....	54	63	70	16	117

Capt. Zinn opened the bids last week for construction of 1,600 feet of breakwater to complete the Milwaukee harbor of refuge. Knapp & Gillen, Racine, Wis., were the lowest bidders, their price being $149,770. The other bidders and prices were: Chicago Star Construction and Dredging Company, $158,112; McArthur Bros., Chicago, $158,208; Carkin, Stickney & Cram, Detroit, $154,036.75; Hausler & Lutz Towing and Dock company, Chicago, $159,285; Adolph Green and W. B. Anderson, Green Bay, $168,576; William A. Starke, Milwaukee, $171,874, and Joseph Wolter, Sheboygan, Wis., $164,993.

Capt. Fish, who has sailed the steamer Riverside for the past two seasons will find it to his interest to correspond with W. W. Kunkle, Ashtabula, O.

LAKE CARRIERS' MEETING

THE ANNUAL GATHERING AT DETROIT SERVES AS A SORT OF CLEARING HOUSE FOR BUSINESS TRANSACTIONS—THE LARGEST MEETING EVER HELD—ELECTION OF PRESIDENT WITHOUT FRICTION—BUSINESS MEN OF THE LAKES IN ATTENDANCE—IMPORTANT FEATURES OF THE CARRYING TRADE DISCUSSED—TONNAGE REPRESENTED BY THE ASSOCIATION INCREASED FROM 618,000 TONS IN 1895 TO 722,863 TONS.

Specially reported by the Editor of the MARINE REVIEW.

Detroit, Jan. 13, 1896.—Immediately preceding the annual meeting of the Lake Carriers' Association each year there is a great deal of talk about big changes in methods of conducting affairs of the association. It is not reasonable to expect that the executive officers of a big organization of this kind should go along with its affairs from year to year without meeting with some opposition. This year complaint was based mainly upon matters pertaining to the handling of grain in Buffalo. There was some objection also from Cleveland to the election of Capt. James Millen of Detroit to the presidency, and for twenty-four hours previous to the opening of the convention there was every indication of a contest between Capt. Millen and Capt. J. S. Dunham for the office. But the result was a repetition of what has occurred in previous years. Persuasion and argument on the part of a few leaders caused Capt. Dunham to retire and nominate Capt. Millen as the only candidate for the presidency when nominations were called for. The strongest element in the association, the representatives of big tonnage in Cleveland, were for Capt. Millen, and although there was no open promise of the place to Capt. Dunham next year, it is quite generally understood that he will have the first call on the honor if he desires it. He has always been an earnest worker in the organization, and one strong plea made in his favor had reference to the influence of the presidency in connection with his plans for leading a movement to lower Chicago river tunnels. But Capt. Millen had practically been promised the office at two previous conventions, and he has been for years in the front rank among vessel owners. Then, too, the Detroit river bridge question is done with for the present year. These were the arguments that again caused the first office in the association to be filled without a contest.

Capt. Dunham nominates Capt. Millen.

In point of numbers the meeting was the largest ever held on the lakes. All parts of the large Cadillac hotel were filled throughout the several sessions. Coal dealers, dock managers, tug men and representatives in fact of all branches of lake shipping mingled with the vessel owners. This annual gathering of the vessel men is looked forward to each year as the occasion for a general exchange of ideas and views of business matters. A large proportion of the people who attend have no voice in the proceedings but they nevertheless put in their time to great advantage. Among those in attendance the following were noted:

VESSEL OWNERS AND OTHERS IN ATTENDANCE.

Cleveland—Thomas Wilson, J. C. Gilchrist, H. A. Hawgood, James Corrigan, Philip J. Minch, Geo. P. McKay, B. L. Pennington, Charles Hutchinson, C. F. Palmer, L. H. Rumage, F. W. Jackson, John Corrigan, John Mitchell, Martin Mullen, Robert J. Mullen, C. C. Canfield, Wm. H. Becker, Wm. H. Mack, N. J. Boylan, R. E. Schuck, John A. Donaldson, M. A. Bradley, C. E. Benham, W. C. Richardson, Harvey D. Goulder, Capt. James Stone, A. B. Conkey, D. Z. Norton, Geo. V. Callahan, John Wedow, Mark Hanlon, John Warner, C. A. Morgan, L. M. Bowers, James Walsh, W. A. Hawgood, W. G. Mather, Alfred Mitchell.

Chicago—J. S. Dunham, J. J. Rardon, W. J. Rardon, J. G. Keith, D. Sullivan, E. T. Hitchcok, Calvin Carr, A. L. Fitch, D. T. Helm, Cyrus Sinclair, J. A. Calbick, Geo. Tebo, Geo. J. Harris, Geo. L. McCurdy, John Prindivlile. G. C Blair, Miles Barry, H. F. J. Porter, H. W. Cook, Homer J. Carr, Thos. Prindiville.

He says the tunnels can be lowered.

Buffalo—J. J. H. Brown, C. H. Keep, George McLeod, W. H. Meyer, George Perew, John Hall, Alex Clark, L. P. Goodale, Ed Smith, Charles Strasmer, J. H. Killeran, Chas. Donaldson, J. C. Fitzpatrick, James Kennedy, H. W. Grimell, R. E. Rispin, Wm. Berriman, J. J. Boland, J. A. Boland, E. C. Roberts, James McKenzie, John Johnson.

Detroit—David Carter, N. S. Whipple, Henry Wineman, L. C. Waldo, John Cusen, W. A. Livingstone, Byron Whitaker, Mart Swain, J. D. Candler, Mark Hopkins, C. F. Bielman, A. E. Stewart, Walter Campbell, E. T. Peck, Horace W. Avery, J. W. Westcott, James Millen, A. A. Parker, Robert Gray, Fred Hart, Albert Stewart, Henry McCollum, C. B. Calder, A. G. Mattsson, Waldo Avery, D. A. McLachlan.

Port Huron—Alvin Neal, H. McMorran, J. E. Mills, Colin McLachlan, Jas. J. Lynn, A. A. Carpenter, D. E. Lynn, H. E. Runnells, Geo. W. Pierce, Wm. Hutchinson, A. H. Gains, E. J. Kendall, Arthur May, John McArthur, Thomas Currie.

Duluth—F. N. La Salle, G. A. Tomlinson, W. H. Singer, B. B. Inman, W S. Brann, W. G. Lerch, J. T. Rose, A. B. Wolvin, A. R. Sinclair.

Bay City—Thomas Cranage, S. P. Cranage, James Davidson, James E. Davidson, Selwyn Eddy, Thomas Madden, F. W. Wheeler, B. Boutell, O. W. Blodgett, J. Bennett.

Marine City—John Drawe, C. T. Morley, C. E. Norton, H. T. Morley, W. S. Roberts, Frank Hart, R. A. Cottrell,

St. Clair—E. C. Recor, E. McQueen, Richard O'Connor, Simon Langell. Chas. Beyschlag, C. H. Westcott, Capt. Fish, W. C. Brown.

Amherstburg—Andrew Hackett, E. C. Gatfield, A. Welsh, F. H. Park, D. McCarthy, D. J. Gerrardin, Wm. Gatfield.

From other ports—Henry Leisk, H. H. Wolf, and Wm. Fitzgerald, Milwaukee; Wm. B. Cady, and H. F. Hughart, Sault Ste. Marie; Frank Owen, Ogdensburg; John Craig, G. G. Hadley, T. J. Southard, L. S. Sullivan and John Nagle, Toledo; Wm. Dulac, Wm. J. Lynn, Wm. Flumer and S. Scott, Mt. Clemens; F. W. Gilchrist, Alpena; Charles Eastman and Gurdon Corning, Saginaw; C. H. Marsden, E. Rathburn, James Stewart, John Randall and S. Lyons.

Capt. J. J. H. Brown, the retiring president, opened the convention with a short reference to the work of the organization during the year, which was of course fully covered by the annual report of the board of managers which is prepared by the secretary, Mr. C. H. Keep. This report, together with that of Geo. P. McKay, treasurer, of Cleveland, appears on pages following in this issue. These two reports cover quite fully the operations of the organization during the year. Mr Keep's report shows an increase in tonnage of the association from 590,000 tons at the close of 1894 to 618,000 tons at the close of 1895 and again to 722,863 tons at the present. These figures represent net registered tons which is, of course, much smaller than the gross tonnage. Expenditures of the organization during the year, including unpaid liabilities, amount to about $26,500. The unpaid liabilities foot up about $4,000, the greater part of which is balances of salaries due to officers. It is expected that this deficit will be cared for in part by moneys to be recieved from insurance companies on account of private lights. Private lights cost the association about $3,000 during 1896. About $9,500 per annum of the association's funds are required to maintain and operate shipping offices at Buffalo, Ashtabula, Cleveland, Chicago, South Chicago, Milwaukee and Toledo. In other words it costs the association about 80 cents for each man actually put on board a vessel by the shipping masters. Then, too, there was an additional big item of expense during the past year in the fight that was made on the Detroit river bridge bill. The treasurer's report gives all of this in detail, and the report of the board of managers reviews all of the leading subjects dealt with by the association.

LIST OF OFFICERS FOR 1897.

Immediately following the reading of this latter report by the secretary, the retiring president called for nominations for the presidency. Those who were not acquainted with what had been going on during the morning, and who expected a contest, were surprised when in a few well-chosen words Capt. Dunham made the nominating speech which resulted in the unanimous election of Capt. Millen. It was done as though there never had been a thought of a contest. The other officers—secretary, treasurer and counsel—were re-elected together on a simple motion from Capt. Thos. Wilson, which was adopted without comment of any kind. Their salaries and duties will be fixed by the executive committee at its first meeting in Cleveland. A committee consisting of A. A. Parker, James Corrigan, Edward Smith, J. C. Gilchrist, W. H. Wolf, J. G. Keith and Thomas Cranage selected the vice-presidents, members of the board of managers and the several active standing committees, and their report was adopted without change. The full list of officers is, therefore, as follows:

Mr. Keep runs the Capitol end of the business.

President—James Millen, Detroit.

Vice-presidents—J.S. Dunham of Chicago, C.E. Benham of Cleveland, David Carter of Detroit, S. D. Caldwell of Buffalo, W. H. Wolf of Milwaukee, W. C. Farrington of Duluth, Howard Shaw of Bay City, F. J. Firth of Philadelphia, L. S. Sulivan of Toledo, M. J. Cummings of Oswego and Geo. Berriman of Erie.

Secretary—C. H. Keep, Buffalo.

Treasurer—George P. McKay, Cleveland.

Counsel—Harvey D. Goulder, Cleveland.

Board of Managers—S. D. Caldwell, Peter P. Miller, E. T. Evans, James Ash, Charles Paine, J. J. H. Brown, John Kelderhouse, W. H. Gratwick, M. M. Drake, W. P. Henry, Edward Smith, H. C. French and James McKenzie of Buffalo; Thomas Wilson, M. A. Bradley, James Corrigan, H. M. Hanna, Geo. P. McKay, H. G. Dalton, Harvey H. Brown, John W. Moore, B. L. Pennington, John Corrigan, W. J. White, Henry A. Hawgood, W. C. Richardson, J. C. Gilchrist, W. D. Rees, John Mitchell, R. R. Rhodes, Caleb E, Gowan, L. M. Bowers, W. H. Becker, W. A. Hawgood, W. H. Mack, C. E. Benham, C. F. Palmer, and Philip Minch of Cleveland; James W. Millen, William Livingstone, Jr., David Carter, D. C. Whitney, W. A. Livingstone, A. A. Parker, L. C. Waldo and J. W. Westcott of Detroit; D. T. Helm, Jesse Spaulding, J. S. Dunham, John Keith, Joseph Austrian, W. R. Owen, C. W. Elphicke, Wiley M. Eagan, J. J. Rardon and James A. Calbick of Chicago; George G. Hadley, W. S. Brainard, A. W. Colton, and L. S. Sullivan of Toledo; James Davidson, Charles A. Eddy, O. W. Blodgett, F. W. Wheeler, B. Boutell, Thomas Cranage, Howard L. Shaw and J. W. McGraw of Bay City; Alex McDougall, F. N. LaSalle, G. A. Tomlinson, W. C. Farrington, and A. B. Wolvin of Duluth; David Vance, R. P. Fitzgerald, J. C. Ricketson, W. H. Wolf and W. H. Meyer of Milwaukee; James McBrier and Geo. Berriman of Erie; F. W. Gilchrist of Alpena; Alvin Neal of Port Huron; C. T. Morley of Marine City; R. E. Schuck of Sandusky; Frank J. Firth of Philadephia; Frank Owen of Ogdensburg.

Capt. McKay riding his hobby—gas buoys.

Executive Committee—James Corrigan, H. A. Hawgood, Thomas Wilson, M. A. Bradley, J. C. Gilhrist, H. G. Dalton, W. C. Richardson, B. L. Pennington, Cleveland; L. C. Waldo, D. C. Whitney, Detroit; W. P. Henry, J. J. H. Brown, Buffalo; R. P. Fitzgerald, Milwaukee; C. W. Elphicke, Chicago.

Committee on Aids to Navigation—Geo. P. McKay, W. H. Becker, Philip Minch, John W. Moore, W. A. Hawgood, Thos. Wilson, C. E. Benham, Cleveland; J. G. Keith, W. M. Egan, Chicago; W. A. Livingstone, Detroit; Frank Owen, Ogdensburg; A. W. Colton, Toledo; James Davidson, West Bay City; Alvin Neal, Port Huron; M. M. Drake, Buffalo.

Committee on Legislation—S. D. Caldwell, E. T. Evans, P. P. Miller, H. C. French, Charles Paine, Edward Smith, Buffalo; L. M. Bowers, H. M. Hanna, James Corrigan, Cleveland; Wm. Livingston, Detroit; J. S. Dunham, Jesse Spaulding, Chicago; C. A. Eddy, Bay City; Alex McDougall, West Superior; F. J. Firth, Philadelphia.

VARIOUS COMMITTEES FOR CONVENTION WORK.

Following the election of officers came the appointment of various committees to take up other work of the convention. Among them were the following: On grain shoveling at Buffalo—James Corrigan, J. C. Gilchrist, Charles Strasmer, Edward Smith, James McKenzie, James Davidson, H. A. Hawgood. On ore trimming and unloading of ore—M. A. Bradley, John Corrigan, C. F. Palmer, B. L. Pennington, M. M. Drake. On Resolutions—J. J. H. Brown, W. A. Livingstone, J. G. Keith, Thomas Cranage, W. H. Becker, C. T. Bielman, and John Mitchell.

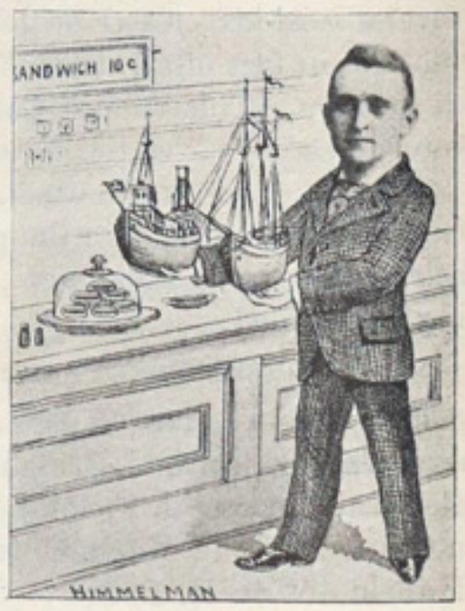
During a waiting period, while committees were at work, Capt. C. E. Benham of Cleveland, representing the grand lodge of the Ship Masters' Association, made a very strong plea in behalf of that organization. He sought no endorsement for the ship masters from the Lake Carriers as an organization, but urged the vessel owners to do all in their power as individuals to help members of the organization. Later on Mr. B. L. Pennington presented a resolution thanking the ship masters for the part they had taken in bringing about the adoption of regulations for the navigation of the Sault river and for their assistance on several occasions in securing the adoption of important measures in congress. These resolutions were adopted with appropriate remarks of commendation from several members.

In support of the efforts that have been made by executive officers of the association to secure appropriations for gas buoys, and with a view also to helping Congressman Burton, who has the matter of gas buoys in hand in Washington, the association adopted the following resolutions:

Resolved, That this association at its annual meeting desires to record its emphatic belief in gas buoys as valuable aids to safe navigation in lake waterways. We believe that an appropriation by congress of $25,000 for these buoys, to be located in our channels and to mark dangerous obstructions which do not require large and expensive lights, will save the United States government several hundred thousand dollars, and will render safe many localities now dangerous to life and property.

PROPOSED CHANGES IN SAULT RIVER RULES.

The secretary laid before the convention several changes which the revenue cutter service proposes in the Sault river regulations. They are suggested by Capt. A. B. Davis, who was in charge of the Sault river patrol during the past season. The most important feature of these amendments is a clause permitting lone steamers to pass through certain parts of the river at a speed of nine miles per hour instead of seven miles as now provided. Proposed changes are:



Mr. Bradley offers any two for a sandwich.

"Amend Rule I to read—No vessel ascending or descending the St. Mary's river shall proceed at a greater speed that nine miles per hour over the ground between the following named points, to-wit: Everen's point and the northern flats lights of the 20-foot channel in Hay lake leading from Neebish channel and between the crib light at the southern entrance of the upper 20-foot and Little Rapids channels and the government piers at Sault St. Marie, and between the western end of the canal piers and Big point.

"Strike out Rules 2 and 3 and in place thereof insert the following rule: No steamer or vessel shall approach another steamer or vessel moving in the same direction nearer than one-quarter of a mile between the point named in Rule 1; but a steamer without a tow may pass a steamer with a tow moving in the same direction between the following points, to-wit: The northern end of Dark Hole and black buoy No. 29 in Little Mud lake, and between the crib light at the northern entrance of Little Rapid channel and the government piers at Sault St. Marie.

"Amend Rule XI to read—No vessel or raft shall anchor in any of the improved channels nor abreast of the government piers at Sault St. Marie, except in distress or during a fog, and any vessel so anchored must always shift her anchorage when directed by the officer in charge of a patrolling vessel to the spot designated by such officer. Add also a rule to exempt all vessels of one hundred tons and less from the provisions contained in the rules relative to vessels moving in the same direction, and the following rules regulating towing:

"Rule 1—Steamers towing vessels astern on a line or hawser in the St Mary's river between the turning channel buoy in the northwestern part of Mud lake and the government piers of Sault Ste. Marie shall tow as follows: The two immediate vessels in tow must not be over 500 feet astern; additional vessels attached to same tow not over 200 feet astern of each other.

"Rule 2—Steamers having one or more vessels in tow shall not be allowed to bring them alongside of the government piers at Sault Ste. Marie astern of the steamer on a line or hawser, without the aid of a tug. But if a master of a steamer having vessels in tow is desirouus of landing them at the government piers without the aid of a tug, he shall drop the steamer alongside of vessels and so make fast to them that they will be under full control of the steamer."

When these suggestions from Capt. Davis were read it was not thought that the question of changes in the regulations would create much interest, but it proved later to be one of the most important subjects at the meeting. The result finally was to refer the whole matter to the executive committee of the organization without suggestions or comment of any kind. Immediately following the reading of the amendments President Millen appointed for the consideration of them a committee consisting of Thomas Wilson, L. C. Waldo, W. H. Mack, Henry Leisk, C. E. Benham, John Shaw and B. L. Penington. It will be noted that the committee includes W. H. Mack, who is a son of the late Capt. Wm. S. Mack, who framed the regulations; Capt. C. E. Benham, who has of late been the leading spirit in the Ship Masters' Association in matters pertaining to the regulations, and John Shaw, admiralty lawyer, who has made several efforts to have the speed of lone steamers increased in the river. The committee brought in a report containing a suggestion that the speed of vessels running the river might be increased to ten miles an hour but recommending that the matter be referred to the executive committee of the association. Mr. Mack of the committee announced that he was interested in the report only to the extent that, even if adopted with its suggestions, it would still leave the matter in the hands of the executive committee of the association where he thought it belonged. He modestly announced that he did not think himself capable of acting in the matter. On the other hand, Mr. Shaw wanted the suggestions adopted, as he is interested in increased speed. It was evident, however, that influential members, like James Corrigan and Thomas Cranage, who took a leading part in the discussion, were opposed to any change in the speed feature of the rules. They succeeded in having the committee report tabled and then referred the whole matter to the executive committee of the association without instructions or suggestions.

TONNAGE DUES, MEMORIALS, MAIL SERVICE, ETC.

The committee entrusted with the consideration of tonnage dues for 1897 was one of the first committees to report. Mr. B. L. Pennington was chairman of this committee, and his associates were Thomas Wilson, James Corrigan, J. S. Dunham, J. C. Gilchrist, M. A. Bradley and James Davidson. The committee reported in favor of a rate of 3 cents per net registered ton on vessels over 1,200 tons and 2 cents a ton on all vessels of 1,200 net registered tons and under that amount. This report, which was adopted, is in line with the claim that the smaller vessels do not reap advantages from deep draft, etc., and should not be compelled to contribute to the expenses of the organization on the same scale as the big ships. It will readily be seen that this assessment cuts down the revenues of the organization materially. It leaves the tonnage dues of the organization at last year's rate for big vessels, but takes a cent a ton off everything below the 1,200-ton mark, and quite a large fleet will be included in this latter class. Mr. W. A. Livingstone of Detroit, who has with his father always advocated a liberal policy in the organization, moved an amendment increasing the dues above the report of the committee. He referred to the treasury deficit under the present dues and made quite a strong plea for his amendment but finally withdrew it on account of the sentiment favorable to reducing expenses. During the discussion Capt. Davidson declared that he would withdraw his vessels unless the tonnage dues were graded, and it was thought unfortunate that he personally referred to Mr. Rockefeller coming into the lake trade with special advantages in his hands on account of his big steel fleet. The personal reference to Mr. Rockefeller was not, however, of a kind to warrant the sensational features that were attached to it in reports of the daily papers.

The resolutions committee also made prompt report on matters submitted to them. First was a resolution of thanks from the association to the post office department for the establishment of the Detroit river mail service. As originally introduced this resolution thanked Postmaster Enright of Detroit, but the committee changed it to read "the department" and added a clause expressing the hope that a delivery service would also be established at Sault Ste. Marie. The resolution was adopted, but a motion was made later to reconsider the vote This was done in part in the interest of J. W. Westcott of Detroit, who is, of course, opposed to the government service, but Mr. Goulder; who was in favor of reconsideration, explained his position by saying that there was local contention in the matter and that it would open the way to other local matters which the organization should avoid, such as the endorsement of Supt. Donald McKenzie of the Sault canal, the endorsement of candidates for collectors of customs, etc. It was also understood that there was some question about Congressman Corliss of Detroit, who is a friend of Westcott's, supporting the movement to build a new vessel for the postal service on the Detroit river. In other words there was some politics in the matter. The convention was, however, thoroughly in favor of the government service and refused to reconsider the vote. The following memorial, also from the resolutions committee, was unanimously adopted:

"The year 1896 will ever be memorable in the history of this organization by reason of the great loss by death of a large number of its most influential members—men who not only assisted in the original development of the association, but also, to a considrable extent, molded its character. By the decease of Capt. John Rice, Capt. E. M. Peck, Capt. W. S. Mack, Mr. H. J. Webb, Col. James Pickands, Mr. Conrad Starke and Mr. Washington Bullard this association has suffered a serious loss. To properly enumerate the services of these members and to recite their association with the great lakes carrying trade would be impossible without telling a large part of its history. This association can only deplore its deep loss and begs to extend its heartfelt sympathy and respect to the bereaved families of our late associates."

Another resolution asks that steps be taken to have congress provide immediately an appropriation sufficient to give to the lakes, in place of the Michigan, a fully equipped modern man-of-war, and that the vessel be built in a lake ship yard. It is noted that the Michigan, which is a fourth-class gun-boat, is now nearly fifty-three years of age, and by reason of antiquated design is obsolete as a war vessel and has not the speed to overtake even our modern freight vessels. It has been decided to make some repairs on the old Michigan and this is one cause for the adoption of this resolution.

Another matter that was readily passed upon by the convention was suggested by Mr. F. W. Wheeler of West Bay City. He said that a number of requirements in the steamboat laws regarding the equipment of new vessels were of an antiquated kind and should be revised. The laws were made at a time when modern steam vessels were not thought of. One provision, for instance, has reference to the location of fire-pumps on main decks, and there are other provisions regarding hand pumps that are equally absurd. The executive committee of the association was authorized by resolution to take the matter up with the Washington office of the inspection service.

DEPTH OF CHANNELS—DAM AT NIAGARA.

It will be noted that in the report of the board of managers, Sec-

[CONTINUED ON PAGE 20.]

Annual Report of the Board of Managers.

Office of the Lake Carriers' Association,
Buffalo, N. Y., Jan. 5, 1897.

To the members of the Lake Carriers' Associattion:—

The board of managers of the association submits herewith its annual report of the proceedings and operations of the association during the past year.

TONNAGE OF THE ASSOCIATION.

Never in the history of the association has it shown so large a growth as during the past year. In the report of the board of managers submitted in January, 1895, the members of the association were congratulated upon the fact that the tonnage of the association had increased from 590,000 tons in 1894 to 618,000 tons in 1895. The figures for 1895 were the largest in the history of the association. This year the board of managers have to report an active tonnage on the books of the association amounting to 722,863 net registered tons, an increase of 105,000 tons over the tonnage of the preceding year, which was the largest in the history of the association. This large increase in the tonnage of the association is doubly gratifying because it indicates that in spite of depression in business, causing a considerale decrease in the profits of vessels, the owners of tonnage on the great lakes have thus demonstrated in the most positive way their conviction that an organization like the Lake Carriers' Association is highly advantageous to those whose money is invested in vessel property, and is in fact a necessity which both commands and deserves their hearty support.

FINANCES OF THE ASSOCIATION.

At the annual meeting of the association in 1894 the dues which had been 4 cents per net registered ton, were reduced to 3 cents per net registered ton. They have since remained at that figure. The treasurer's report, which is submitted herewith, shows that the dues have been remarkably well paid, but that they have not been sufficient during the past year to meet all expenses. The report shows that the tonnage dues collected for the season of 1896 have amounted to $20,328.96, and that the unpaid dues are only $390.85. We do not anticipate a failure to collect the dues remaining unpaid, and are of the opinion that the full amount will be collected. It will be noticed that the dues collected for the year 1896 are not quite equal to 3 cents per ton on the full tonnage of the association. In explanation of this discrepancy I would say that a large amount of tonnage came out after the season of 1896 opened. Some of these vessels did not go into commission until after September. In all cases of new vessels coming out during the season it has always been the practice of the association to collect dues for that portion of the season during which such new vessels were in possession of their owners. The treasurer's report shows in detail the expenditures of the past year, and also contains a full statement of the unpaid liabilities of the association. From this statement it appears that the private light-keepers have been paid in full for the private lights maintained, and that all the salaries of the shipping-masters, excepting the chief shipping-master, have been paid, and also all miscellaneous bills. The unpaid liabilities consist of part of the salaries of the officers of the association, and some small disbursements to be made from the present time until May 1, for the rent of offices occupied by shipping-masters, etc. There is also a note of $1,000.00 due to the Union National Bank of Cleveland. The total unpaid liabilities of the association over and above the uncollected dues amount to about $4,000. A careful examination of the report in comparison with former reports will easily show how this deficit has come about. In the first place, among the disbursements for private lights there is one item of $750.00 which is a balance for the private lights for 1895. It is therefore a deficit carried over from a former year. There is also an item of $200.00 for the balance of salary of the chief shipping-master for 1895. This accounts for about $1,000.00 of the deficit. Among the expenses of shipping offices for the past year will be noticed several items amounting to another $1,000.00 relating to a shipping office at Milwaukee. This is a new shipping office never maintained until 1896, when it was established at the request of a very large number of members of the association. While the Milwaukee shipping-office has not been quite as extensively used as had been anticipated, it has still shipped on board of vessels 453 men during the past season, and unquestionably it has been a decided convenience to many members of the association.

The expenses of the association for maintaining private lights during the year, 1896 have been very large, in fact about $3,000.00 more than usual. An additional light has been maintained by the association on the middle ground at Port Huron; six floating lights have been maintained during the entire season at Ballard's reef, and a set of water signals has been maintained by Duff & Gatfield and operated so as to inform vessels approaching the dangerous part of the Detroit river, whether by day or night, of any unusual and dangerous stage of the water. All members of the association will agree that these expenses have been an absolute necessity; that they have saved in time and expense many times their cost. Nevertheless, they have taken about $3,000.00 from the treasury, and this item, with the extra cost of the shipping-office at Milwaukee, and the deficit carried over from the previous year, more than accounts for the present deficit. An examination of the treasurer's report will further show that the association has been under a very large extra expense by reason of the fight which has been made against the placing of bridge piers in the Detroit river. The manner in which the Detroit bridge bill was pressed for passage by the powferul interests behind it, made it necessary to oppose them not only vigorously but continuously. There was always the danger of a surprise. The bridge interests had watchful agents always on the spot at Washington, and this fact necessitated that there should be equal watchfulness and vigor in opposing them. At an important hearing before the Senate committee on commerce the advocates of the bridge appeared with a large delegation, including the governor of Michigan, the mayor of Detroit, the president and general counsel of the Michigan Central Railroad, able engineers employed by the railroad company, the president of the Detroit Chamber of Commerce, and a delegation of the most influential and prominent business men and lawyers of Detroit. The Lake Carriers' Association was also represented at the hearing by a considerable delegation, including a considerable number of vessel masters whose expert testimony would be a valuable aid to the committee. The counsel of the association was obliged to be in Washington during a considerable part of last winter, and again on several occasions since. When his professional engagements compelled him to leave Washington, other officers of the association were obliged to go there, and stand watch during his absence. All this involved very large expense, but the result has certainly justified the energetic measures which were taken.

As a partial offset against the deficit caused by this increase in the expenses of the association, your board of managers fully expects that the association will receive some assistance from the underwriters doing business on the great lakes towards the maintenance of the extra private lights required during the past season. The extra and temporary lights and water signals which we have maintained in 1896 have cost us about $3,000.00. We have proposed to the underwriters that we should maintain all our regular lights unaided and that we should stand half of the expense of these extra and temporary lights, and that they should contribute the other half of this extra expense, that is to say about $1,500.00. We feel that we can fairly ask this of the underwriters for several reasons. In the first place, while the lighting at Ballard's reef and the water signals, etc., have undoubtedly saved vessel owners a considerable amount of time and something also in the way of expense, the largest part of the actual money saving has inured to the benefit of the insurance companies. In the second place, we feel that it is decidedly for the interests of the insurance companies that they should co-operate with the Lake Carriers' Association in such matters. It was certainly for their interest that the lights at Ballard's reef should be est blished promptly and maintained efficiently, and if a like emergency occurs again it will again be for their interest that an organizaion like ours should deal effectively with the situation for the interest both of owners and underwriters. It is also to be considered that we are not asking the underwriters to enter upon any continuous expenditure of this kind. We have already taken steps to have the government place lights at Ballard's reef, and there is little question but that they will be established at some time during the coming season of navigation, possibly when navigation opens. Once before we asked the underwriters to help us with some private lights, and they generously responded. We promised them then that the contribution was temporary, and that the lights for which they contributed would soon be taken up and maintained by the government. We secured the necessary legislation, and the lights in question, viz. the Lime-Kilne crossing and Bar point light-ships, have been maintained by the government ever since. Finally, we have appealed to the

underwriters to join with us because to a certain extent we and they have interests in common and are working along the same lines. We may fairly say to them that the Lake Carriers' Association is the best friend they have. The channel improvements and the aids to navigation, which we have secured, are working night and day during the season of navigation to prevent losses. So also are the rules and regulations which we have obtained so often in the interests of safe navigation. We have asked the underwriters to compare the record of Ballard's reef for 1896 with that of 1895, and to count the collisions in the Sault river since the new regulations went into effect, and compare with those which prevailed in former seasons. We entertain no doubt of the success of this appeal. A number of the most prominent underwriters on the lakes have already written that they regard the matter favorably, and we may fairly expect their co-operation. In this event, the deficit for the year will be reduced to about $2,500.

Your board of managers feels that it is altogether unlikely that the expenses of the association another year will be as great as they have been during the past year. They also feel that they can count upon quite a material increase in the tonnage of the association next season. An increase of at least 40,000 tons may be said to be in sight already, consisting as it does of new vessels being built by members now in the association, and of vessels already built and owned by members, but not yet put in commission. We do not think therefore, the deficit in the treasury for the year, large though it is, so very serious a matter as it might at first sight appear.

OPERATIONS OF THE SHIPPING-OFFICES.

Shipping-offices of the association have been maintained at Cleveland, Chicago, South Chicago, Buffalo, Ashtabula, Toledo and Milwaukee. The following condensed report taken from the annual report of Shipping-Master Rumsey shows the number of men placed on board vessels at each of these points, as follows:

Put on board at Cleveland	1,503
Sent from Cleveland to other ports	75
Put on board at Chicago	2,497
Sent from Chicago to other ports	486
Put on board at South Chicago	2,739
Put on board at Buffalo	1,912
Put on board at Ashtabula	1,253
Sent from Ashtabula to other ports	40
Put on board at Toledo	880
Put on board at Milwaukee	453
Total	11,838

There have been no complaints received by the board of managers during the past year as to the operation of any of the shipping-offices. The board desires to call your attention to the very large number of men placed on board of vessels by these offices. There are undoubtedly members of the association who do not use the shpping-offices, but an examination of this report will convince them that these offices do a very extensive work for members, and that they are of great utility and value. The board thinks there can be no question that the operation of these offices is not only of value to those who actually apply to them for men, but that the fact that they are in operation and stand ready to do their work makes them very valuable to all members of the association. The treasurer's report shows that about $9,500.00 per annum of the association's funds are required to maintain and operate these shipping-offices. In other words it costs the asscciation about 80 cents for each man actually put on board a vessel by the shipping-masters.

THE DETROIT BRIDGE BILL.

In reviewing the operations of the association during the past year, the first place should be given to a brief account of the fight which the association has put up against the placing of obstructions in the Detroit river. Considerable has been said on this subject in the discussion of the treasurer's report. It is perhaps sufficient to say now that a bridge bill was introduced in congress last winter for a railroad bridge across the Detroit river with two large piers in the channel. It was felt by the members of the association that the throat of the great commerce which moves on the great lakes should not be obstructed by bridge piers. At the present time there are no piers of any kind in the navigable channel on the great lakes between Buffalo and Duluth and Chicago. The local conditions at Detroit in the way of smoke, shore lights, cross traffic, local passenger service, were all such as to make piers in the river opposite the city doubly objectionable The last annual meeting determined that the Lake Carriers' Association ought to oppose the bridge with all its power. The counsel of the association undertook the fight, and he has put up a contest against great odds which should win for him the hearty thanks of every member of this organization. He has been at all times during the past year ready to drop his own private business to work for the association in this matter. No one, except the other officers of the assoiation, can know what an amount of time and work and thought he has devoted to this subject. As a result of his efforts, the bridge bill is dead so far as this congress is concerned, and it is the opinion of the best judges, that it will never be revived in anything like its present form, and that if so revived it will certainly be defeated. The thanks of the association in this matter are due not only to the counsel of the association, but to other members who have acted under his direction in opposing the bridge and have turned from their private affairs to assist our counsel in the task which he had undertaken. The president of the association has made repeated trips to Washington, and other members of the association have also worked hard in a variety of ways.

REGULATING NAVIGATION IN THE ST. MARY'S RIVER.

The last annual meeting had under consideration the adoption of a system of rules and regulations to govern vessels in the dangerous parts of the St. Mary's river, designed to diminish the number of accidents and collisions in that locality. A committee was appointed to act upon the subject and they subsequently went to Washington to take up the matter with the commissioner of navigation and the revenue marine officers. A bill was passed through congress giving the secretary of the treasury power to prescribe rules and regulations for the navigation of the St. Mary's river, such rules and regulations when prescribed to have the force of law. A great deal of pains were taken in the drafting of the rules, and the matter of speed to be permitted in different localities was very carefully considered. At the opening of navigation the rules were put in force and have remained in force during the season. It was understood that the rules were in some degree experimental, and the idea of those who framed them was to give them a fair trial and amend them only so far as experience showed they could be improved. There is no doubt that these rules have been of great assistance in preventing accidents in the St. Mary's river. Whether the regulations are now perfect or not is a matter in which opinions will undoubtedly differ. The power to make the rules rests with the secretary of the treasury, and he will undoubtedly be guided in the matter largely by the wishes of vessel owners and by the reports of the revenue officers, whose duty it is to enforce the regulations. During the early part of the season there were a great many violations of the regulations for which fines were imposed. Where it appeared that these violations had been technical or unintentional these fines were reduced to a nominal sum upon the understanding that there should be no repetition of the offense, and that the remission of fines could not be so easily obtained again. The rules stand as another one of the contributions which the Lake Carriers' Association has made to safe navigation on the great lakes and to the protection of prudence and care against recklessness and selfishness.

AIDS TO NAVIGATION.

The committee on aids to navigation during the past year has obtained some valuable lights which have been greatly appreciated by masters. In this connection your attention is especially called to the fact that the Canadian government has established two gas buoys at Point au Pelee passage, which have given great satisfaction to vessel owners. The prompt response which the Canadian authorities made to the request of our American vessel owners for additional aids to navigation at this dangerous point on the Canadian side of the international boundery line, where our government was powerless to protect our vessels, deserves the thanks of the association. With a comparatively small tonnage on the great lakes and with a vast coast to light on the ocean and St. Lawrence river, where the Canadian marine interests are large, the Canadian authorities needed little urging to induce a prompt response to our request for assistance on Lake Erie. This was a gracious act not to be forgotten. The association has also obtained the support of the United States light-house board for a large number of new aids to navigation on the great lakes, and a number of the most important of these aids have been placed by the secretary of

the treasury in his annual estimates, and some of them will undoubtedly be appropriated for at this session of congress. Among the lights so recommended and estimated for is a set of three lights at Ballard's reef, Detroit river, which will relieve the association from the large expense which they now run under for private lights at that point. A number of new lights for which appropriations were obtained some time ago, but where delay had occurred in the building of the lights, have now been put in operation. The fog-signal at North Manitou island is perhaps the most important of these, and the new light at that point will be ready when navigation opens in the spring.

In one respect the past year has been a disappointment to the committee on aids to navigation. There are a number of localities on the great lakes where gas buoys would be of great assistance to navigation. These gas buoys are inexpensive and cost little to operate, as they do not need the services of a light-keeper, and do not easily get out of repair. While, of course, they do not take the place of a large light-ship, or a coast light, they can be used to mark turning points and small obstructions in channels and in the course of vessels. Among the places where they could be used to great advantage are Gravelly island, Poverty passage, Green bay; Lansing shoal, north of Squaw island; the turning point where the can buoy is now located in Mud lake, St. Mary's river, and to mark the dangerous points in the navigation of the St. Mary's river above Round island. We have not yet succeded in getting the light-house board to locate buoys at these points, but we are going to make a determined effort to get an appropriation this winter for gas buoys for use on the great lakes. Congressman Burton of Cleveland has the matter in charge, and will have the active support and assistance of the association in his efforts. We believe that the interests asking for thesegas buoys are so lagre and so deserving that congress will not refuse the comparatively small appropriation necessary for the protection of these and other localities in this economical and effective way.

INCREASE IN THE AVAILABLE DRAFT OF WATER.

The past year has seen some important events in the history of lake navigation. The work on the so-called 20-foot channel between Duluth, Chicago and Buffalo has progressed rapidly, and has reached a point where it has added materially to the available draft of water at Lake Superior. The government has also placed some of the most important harbors on the great lakes under the contract system, and very extensive work is to be undertaken at Chicago, Duluth, Cleveland and Buffalo. In the passage between Lake Huron and Lake Erie, however, where much progress has been made in the improvements at the points named in the 20-foot channel project, it has become more than ever apparent that any material increase in the available draft of water between Lake Huron and Lake Erie is not so close at hand as was expected. It will be remembered that the 20-foot channel project names certain localities where work is to be done in deepening the channels. These localities form part of the "adopted project" and the money appropriated for the "20-foot channel" must, as we understand it, be expended at these points and not elsewhere. It has become very apparent that there are certain points in the Detroit river not mentioned in the "20-foot channel project" where very extensive work has got to be done before the draft of water through the Detroit river will be very materially increased. We refer, of course, to Ballard's reef, and to the channel abreast Bois Blanc island. Some work has been done to Ballard's reef, but it has not been done under the 20-foot channel appropriation or under the so-called contract system, by virtue of which a contract can be let for the entire work. The work at Ballard's reef, so far as it has gone, has been done under small appropriations made in the river and harbor bill. Under this system it will certainly be several years before the Ballard's reef channel is properly improved. Meantime the millions which the government has spent in providing deeper water at Round island, at the canal and lock at the Sault, in Hay Lake channel, at Sailors' Encampment, at the foot of Lake Huron, at St. Clair flats, Grosse point, Lime-Kiln crossing and Bar point has given to vessels only a slight additional draft, and can never give them anything further until the channel at Bois Blanc island and Ballard's reef is extensively improved. It is highly important that this association, representing as it does, one of the great interests for whose benefit the government has made these large expenditures, with results which are so far very disappointing, consider this situation. We say that the vessel interests represent one of the great interests for which the channels were projected. The other interest, and a still greater one, is that of the producer of the west and northwest. Unquestionably the salvation of a large territory adjacent to the great lakes lies in a continued increase of facilities and a continued decrease in the cost of carrying its products eastward. Some vessel owners have doubts whether deeper channels will assist them, but the whole history of the lake commerce tends to show that the prosperity of those engaged in it is dependent upon the continued growth of the traffic and that the continued growth of traffic is in turn dependent upon greater facilities. It should be remembered also that the United States government is doing extensive work in the direction of cheaper transportation at other points. It has spent millions on the harbor at Galveston, and the railroads running to that po'nt are reaching out for the traffic which was formerly tributary to the great lakes. The state of New York is now spending nine millions of dollars on improvements in the Erie canal, which are designed to assist and co-operate with the deeper channels in the lakes in maintaining the supremacy of the northern route from the west to the seaboard. The members of this association should carefully consider this subject in its broadest aspects, and determine what action should be taken to expedite the completion of the deep-water channel. If Ballard's reef and the lower Detroit river are to be brought in harmony with the other points where extensive improvements have been made, the work there should be put under the contract system and sufficient appropriations made to push it along as fast as possble.

The following shows substantially the present condition of the deep-water channel between Lake Erie and Lake Huron: The work at the foot of Lake Huron as far as the entrance of the St. Clair river is finished. The approach to the St. Clair flats canal, and the work at the canal itself, is finished. The new Grosse point channel at the foot of Lake St. Clair will be finished in June or July, 1897. At present there is an available draft of water at that point of 18 feet. The improvement at Bar point from the foot of Bois Blanc island, and extending to the Detroit river light, will require the whole of next season for completion, but in the meantime at the present stage of water there is over 18 feet of available draft. At Ballard's reef the available depth (referred to a stage of water which is the mean of the readings of the Lime-Kiln guage, since Nov. 18, or 1.2 feet below the zero of that guage) is in the 300 feet west of and adjacent to the center line of the proposed channel, 16 feet 3 inches. This depth is upon a ledge of rock, the least depth at all other parts of this channel being 16.8 feet. In the 150 feet east of and adjacent to the center line of the proposed channel there is a minimum depth of 16.8 feet. At Lime-Kiln crossing the actual depth is 18.8 feet, and from there to the foot of Bois Blanc island the actual available depth at the stage of water above referred to is 16.8 feet in a channel 600 feet wide. From the foot of Bois Blanc island the actual available depth is 18 feet, and when the contract in force is completed next season the channel there will be 800 feet wide, with 19½ feet of water at the present stage.

There is in the hands of Col. Lydecker about $50,000.00 available for work next season at Ballard's reef and at Lime-Kiln crossing to the foot of Bois Blanc island. Specifications for the work are not yet prepared, as it is desired to make some surveys through the ice, if possible, before preparing them and letting the contract. Col. Lydecker states that he is not now able to predict what increased depth may be obtained at Ballard's reef and below the Lime-Kiln crossing with the funds now available, but he hopes to secure a channel depth of approximately 18 feet at the stage of water referred to above.

GRAIN SHOVELLING AT BUFFALO.

In the spring of 1896, the association renewed its contract with James Kennedy of Buffalo to shovel all grain brought to that port in vessels of the association. Some changes were made in the contract with Mr. Kennedy, but the scale of charges for shovelling remained as in 1895. It will be remembered that in 1893 the shovelling charges at Buffalo were as follows: For grain in the hold of steamers, $4.00 per thousand; for grain between decks in steamers, $4.50 per thousand; for wet or damaged grain $10.00 per thousand; for grain in sailing vessels, $3.50 per thousand. In 1894 the rates for shovelling grain in the holds of steamers was reduced to $3.75 per thousand, the other rates remaining as before. In 1895 the Lake Carriers' Association first took hold of the matter, and after very careful negotiations carried on for the vessel owners by the present head of the association, a contract was entered into by which the shovelling rate was reduced to $3.50 per thousand on all grain, irrespec-

tive of its position in the vessels, or of the kind and condition of the cargo, or of the character of the vessel in which it was carried.

It is always desirable to remind the members of this association of the benefits they receive from the various improvements and reforms which it has instituted. There are always some members who are too ready to forget these benefits and it is for them that your board of managers has caused to be prepared an estimate showing the operations of the grain shovelling contract for 1896 in Buffalo, and showing as closely as can be estimated the actual saving which this contract has effected for vessel owners.

There was received at Buffalo of grain and flax seed in the season of 1896, excluding grain received at Black Rock, and not shovelled under our contract, 164,000,000 bushels, on which the shovelling charges prior to the the season of 1895 were $3.50 per thousand for sailing vessels; $4.00 per thousand for single-deck steamers and the lower hold of steamers having two decks; $4.50 per thousand when steam shovels were used, and for hand shovelling on all grain between decks and in fantails, $10.00 per thousand when the grain was heated or otherwise damaged, and anywhere from $6.00 to $10.00 per thousand, when a vessel unloaded at two or more elevators, on the quantity that was discharged at the last elevator. Under the operation of the contract for the season of 1896, there has been a saving of 25 cents per thousand on 114,000,000 bushels in the lower hold of steamers. This amounts to $28,500, which is considerably in excess of entire sum collected from vessel owners by the Lake Carriers' Association during the year 1896. On the cargo of steamers between decks, amounting to 20,000,000 bushels, there has been saved an additional $20,000. On 15,000,000 bushels damaged and hot grain there has been saved $97,500; a total of $146,000.00 saved during the season of 1896 by the operations of the contract system, without taking into account the extra charge under the old system for remnants—that is to say, the grain left in vessels on arriving at a second elevator—and without taking into account a great saving of time, which to the vessel owner is the same as money. It is the judgment of those who have carefully watched the operations of the grain shovelling contract at Buffalo during the past year, that an unprecedented quantity of grain has been handled in a manner thoroughly satisfactory. The increase in the amount of grain which has arrived at Buffalo this year over any previous year has been so large that at times, when large numbers of vessels were bunched at the port, some little delay was inevitable, but the business has been handled with great dispatch. Masters of vessels will unquestionably testify that the contractor has been zealous and accommodating, and that delays in unloading grain cargoes have been much less than might have been expected from the unusual conditions prevailing at that port.

FUELING AT BUFFALO.

Your board also desires to call your attention to the fact that while the question of the price of fuel at Buffalo has not been as burning a problem in 1896 as it was in 1895, the saving of money to the members of the association did not stop when the agitation of this question stopped a year ago. The fight that was made in 1895 against overcharge for fuel in Buffalo has done its work during the season of 1896. In quality and price the fuel furnished steamers in Buffalo this season has been satisfactory, if the absence of complaints can be taken as evidence of that fact. We estimate that vessel owners have saved 40 cents per ton on 200,000 tons of fuel taken on board at Buffalo, a total saving of $80,000.00.

It is well also to note the fact that the reductions in ore trimming charges, which were obtained two years ago by negotiation between committees of the association and the parties doing the trimming at the various ports, have continued during the season of 1896, and the very large saving which was obtained in previous years has continued during the past year. It will undoubtedly be the pleasure of the association at its annual meeting to appoint committees as in former years to take up the question of grain shovelling at Buffalo and ore trimming at the various ore shipping ports, so that these very important questions, in which all vessel owners are concerned, may be dealt with systematically and for the benefit of all.

MISCELLANEOUS.

Among less important things which have been accomplished during the past year, but which mean something in convenience and saving of time to our members, is the appointment by the United States government of deputy collectors of customs who issue clearances to vessels at the Masabi dock, Duluth, thus making it unnecessary for captains to go to the custom house at Duluth, to get their clearance papers.

DEATH OF PROMINENT MEMBERS OF THE ASSOCIATION.

In conclusion it is the sad duty of your board of managers to report that during the past year the association has suffered grievous losses in the deaths of a number of it most prominent members. Washington Bullard, William S. Mack, John Rice, E. M. Peck, James Pickands, H. J. Webb, and Conrad Starke have all died since the last annual meeting. Of these Conrad Starke had been a member of the association for two or three years before his death, though he never took any active part in its affairs. Col. Pickands and H. J. Webb seldom attended meetings of the association in person, but the large tonnage which they represented has always been enrolled upon our books, and their associates in the management of this tonnage have always been our staunch friends. They were progressive and public-spirited men and always ready to do their share in any concerted movement on the part of vessel owners to improve their service to the public, or the conditions under which business was transacted. Capt. Peck had been a member of the association since it was organized. He took an active interest in all its operations, always attended its annual meetings, on several occasions served actively on its committees, and might have been the president of the organization had he not felt that his age was a bar to his acceptance of that office. Mr. Washington Bullard, the manager of the Union Steamboat Company fleet, spent a life time in the vessel business, and was one of the original organizers of the Lake Carriers' Association. Until two or three years ago, when his health became broken, Mr. Bullard was one of the most active participants in the business of the association. At one time he was prominently mentioned for the presidency of the organization, but withdrew his name from consideration as his health would not permit him to serve.

It is hardly necessary to speak of the services of Capt. Rice and Capt. Mack to the Lake Carriers' Association. The members of the association who are in attendance at the annual meeting will miss their presence on the floor, and will feel the want of their valuable leadership in various matters which will come up for discussion. Both kept themselves thoroughly informed in all matters dealt with by the board of managers, and no two members of the association served oftener on the active sub-committees which transact the most important business of the association than Capt. Mack and Capt. Rice. The death in one year of so many of our prominent members is a very serious blow to the association, and some fitting expression of our sorrow will doubtless be given by the members of the association who are in attendance.

Respectfully submitted on behalf of the board of managers by

J. J. H. Brown, President.

Charles H. Keep, Secretary.

ANNUAL REPORT OF GEO. P. McKAY, TREASURER, IN ACCOUNT WITH THE LAKE CARRIERS' ASSOCIATION, COVERING THE FISCAL YEAR ENDING JAN. 4, 1897.

RECEIPTS.

From balance on hand Jan. 7, 1896, as per former report		$ 594 81
Loan from Union National Bank of Cleveland	$1,500 00	
" " " " "	1,000 00	
		$ 2,500 00
For private lighting		182 70
Tonnage dues, 1895		384 84
" " 1896		20,328 96
Total receipts		$23,991 31

DISBURSEMENTS.

Salaries for 1896, secretary	$1,200 00	
treasurer	700 00	
attorney	1,100 00	
		$3,000 00
Incidentals, secretary's office	$ 48 33	
treasurer's "	25 19	
		$ 73 52

Salaries of shipping masters, Cleveland		$1,900 00		
	" bal.of'95-	200 00		
	Buffalo	900 00		
	Chicago	1,640 00		
	So. Chicago	600 00		
	Ashtabula	685 67		
	Toledo	600 00		
	Milwaukee	900 00	7,425 67	
				$10,499 19
Expense of shipping-offices:				
Cleveland,	rent	$ 98 75		
	telephone	54 00		
	improvements fall 1895	31 54		
	provisions for sailors	234 75		
	office supplies, repairs	112 30		
			$ 531 34	
Chicago,	rent	$ 335 00		
	telephone	106 03		
	improvements	13 98		
	office supplies	50 19		
			505 20	
So. Chicago,	rent	$ 143 80		
	telephone calls	12 75		
	office supplies & repairs,	54 13		
			210 68	
Buffalo,	rent	$ 183 33		
	telephone	30 00		
	office supplies	80 21		
			293 54	
Ashtabula,	rent	$ 100 00		
	office supplies	28 13		
			128 13	
Toledo,	rent	$ 100 00		
	office supplies	3 60		
			103 60	
Milwaukee,	rent	$ 25 00		
	office supplies	55 78	80 78	
				$ 1,853 27
To Union National Bank of Cleveland:				
Interest on loan of $1,500 for six months		$ 46 25		
Payment of note held by bank		1,500 00		
Interest on note of $1,000 for six months		36 36		
				$1,582 61
Extraordinary Expense:				
Ship Master's transportation and hotel expense to Washington, to attend the hearing of Detroit river bridge matter before Senate committee, and hearing on the raft bill before House committee on rivers and harbors; Captains C. E. Benham, Chas. Wilson, Holmes, Henry Leisk, W. E. Rice, Loftus, Wm. S. Mack, F. D. Welcome, and R. Young				$ 317 10
Transportation and hotel expense of President J. J. H. Brown and Messrs. Keep, Goulder, McKay, Dunham and Mack on trips to Washington, Cleveland, Chicago, Hamilton and Ottawa, in interest to opposition to Detroit river bridge piers, raft towing, and concerning other legislative matters				$1,619 17
Expenses in connection with the Detroit river bridge contests:				
Legal services		$ 232 48		
Services of consulting engineers		275 00		
Statistics on Detroit river traffic		20 00		
Telegraph and Telephone Service		409 65		
Printing and stenography		221 46	1,158 60	
Traveling expenses of officers of the association, in interest of aids to navigation: Account of private lighting and buoys, Messrs. Keep, McKay and Mack, various trips to Detroit and Amherstburg		144 00		
Account of Messrs. McKay and Keep to Washington and New York, before light-house board, and to secure new tonnage		101 40		
Account of fueling committee		27 65		
Account of Capt. Wm. S. Mack, to Washington, in interest of rules for "Soo" river patrol		70 25	343 30	
Account of Chief Shipping Master A. R. Rumsey to Milwaukee to install Capt. Lennon in office		$ 51 50		
Account of A. R. Rumsey, several trips to other ports		23 50	75 00	
Account of telegraph service		$ 65 91		
Account of printing and stationery		171 65	237 56	
Maintaining private lights, balance 1895		750 00		
Maintaining private lights, for 1896		5,100 00		
Lighting and staking Grosse point channel		392 00	6,242 00	
Engraving of memorial on death of Gen'l O. M. Poe		$ 25 00		
Rent of Music Hall, Detroit, for annual meeting, January, 1896		25 00		
Capt. Wm. S. Mark, entertaining		5 00	55 00	
To Capt. L. A. Garn, first half dues paid twice, money refunded			$ 8 33	
Total disbursements			23,991 13	
Balance on hand			18	
			$23,991 31	

In addition to the foregoing I have to report the following unpaid liabilities:

To salaries, C. H. Keep, secretary, balance due for 1896	$ 800 00		
H. D. Goulder, attorney, balance due for 1896	1,400 00		
Geo. P. McKay, treasurer, balance due for 1896	300 00		
A. R. Rumsey, shipping master, balance due for 1896	800 00	$3,300 00	
Rents, Buffalo shipping office, for Jan., Feb. and March, 1897	37 50		
Cleveland shipping office, Oct. 1, 1896, to April 1, 1897	62 49		
Cleveland telephone rent, Jan. 1 to April 1, 1897	18 00		
South Chicago office rent, Dec. 1 to April 1, 1897	60 00		
Chicago office rent, Dec. 1 to April 1, 1897	140 00		
Milwaukee office rent, July 10 to April 10, 1897	75 00	392 99	
		$3,692 99	
To note held by Union National Bank of Cleveland		1,000 00	
Unpaid tonnage dues of 1896	$ 390 85		

Ballard's reef buoys and lights were kept in place from April 18 until Dec. 18, 1896, and float light maintained by J. J. Lynn on head of Sarnia middle ground from April 18 until Dec. 20, 1896.

Respectfully submitted,

[Signed] GEO. P. MCKAY, TREAS.

Thrust Bearing for Propeller Shafts.

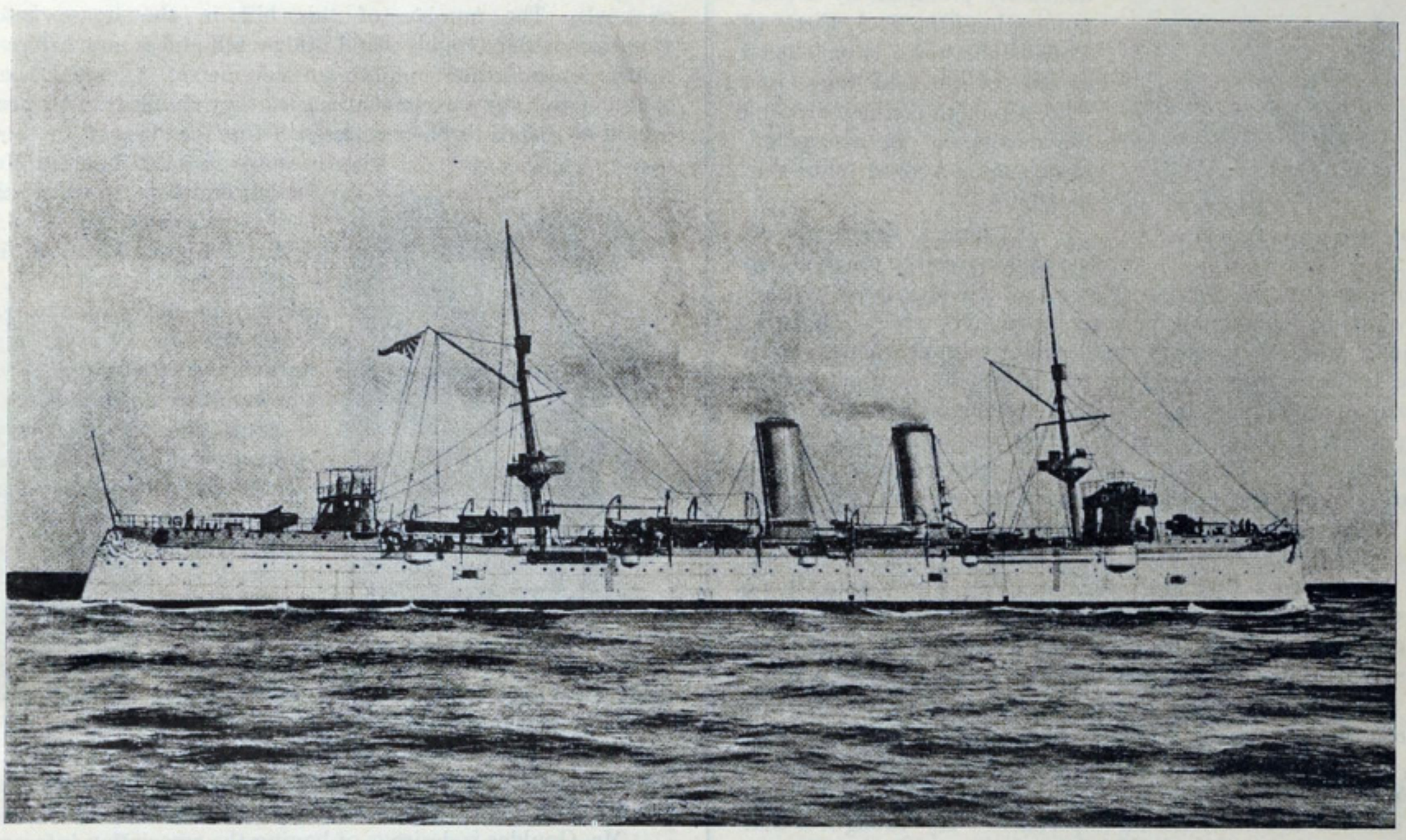
Editor Marine Review:—In the Marine Review of Dec. 31, 1896, you illustrate a thrust bearing for propeller shafts, credited to the Iron Age. From a perusal of the article one would assume that the Mossberg & Granville Mfg. Co. had made a new discovery. Such, however, is not the case. Except that good hard cast iron was used for the disks, the bearing as described with steel conical rollers placed radially in a gun metal cage, with the conical disks to form the thrust bearing and collar, was made at the Morgan Iron Works, New York, for the United States steam sloop of war Seminole at the time the engines for that vessel were being built by them in 1859 and 1860.

R. Chestnut,

Oswego, N. Y., Jan. 13, 1897.

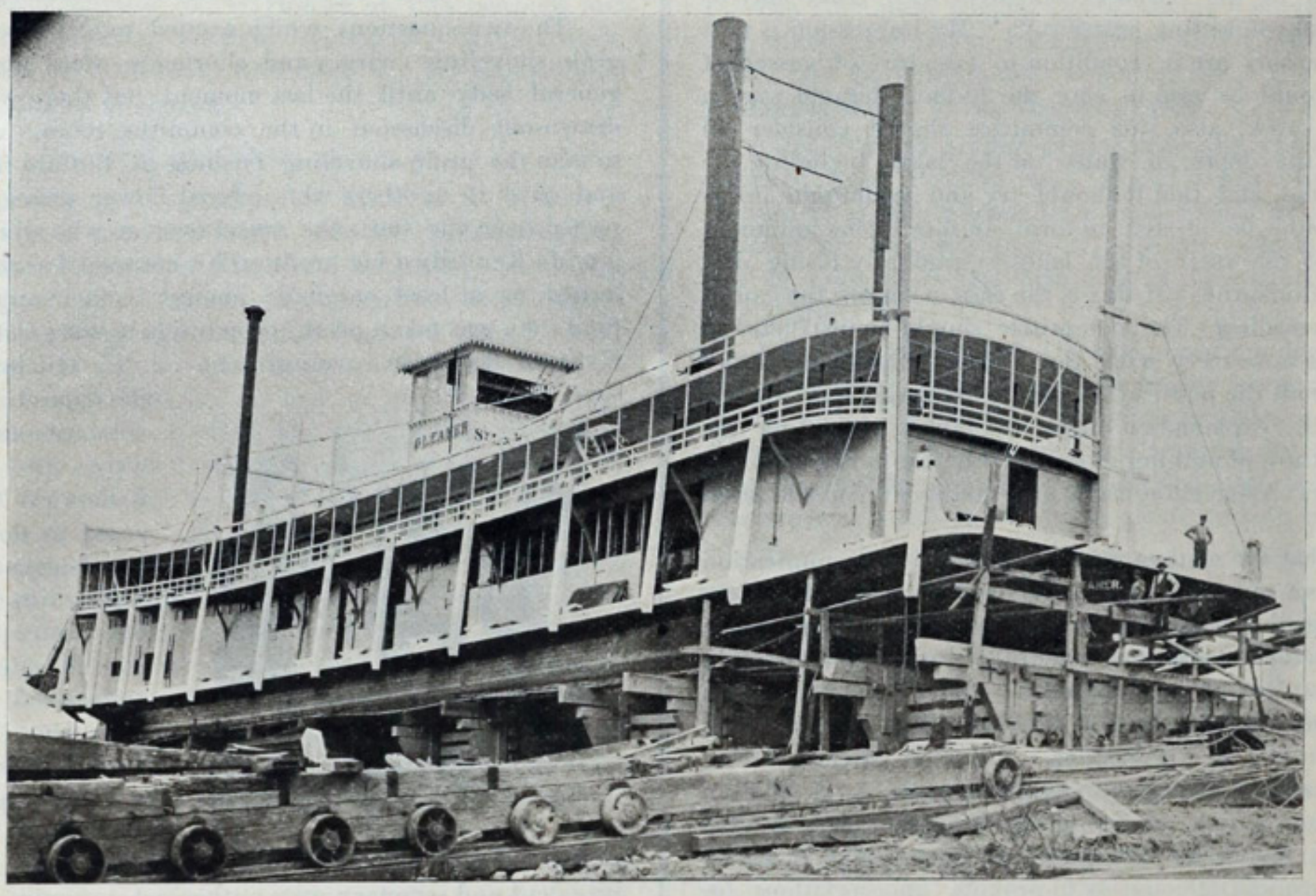
Ship Masters' Association—New Officers.

Port Huron lodge No. 2: President, W. E. Rice; first vice-president, H. Zealand; second vice-president, G. W. Pierce; chaplain, Charles W. Black; financial and recording secretary, M. A. Budd; treasurer, Henry Davis; marshal, Harry Maitland; warden, John Bradshaw; sentinel, Wm. J. Cowles.



SECOND CLASS JAPANESE CRUISER YOSHINO.

NOTE.—The cruisers to be built by Wm. Cramp & Sons Ship and Engine Building Co., and the Union Iron Works, are practically of the same dimensions as the Yoshino and will be very similar in other respects.



MISSISSIPPI RIVER TOWING STEAMER GLEANER.

NOTE.—The Gleaner was built at the Madison (Ind.) Marine Railways by David S. Barmore, proprietor. She is a first-class tow-boat and will tow eight barges containing 60,000 bushels or 1,800 tons each at a trip, making a total cargo of 10,000 tons, between up-river ports and New Orleans.

[CONTINUED FROM PAGE 13.]

retary Keep gives considerable space to the progress of work on the deep channels. This was undoubtedly prompted by a communication from F. J. Firth of Philadelphia, who is an official of one of the lake lines, and who, although unable to attend the meetings of the association, always takes a great interest in its affairs.

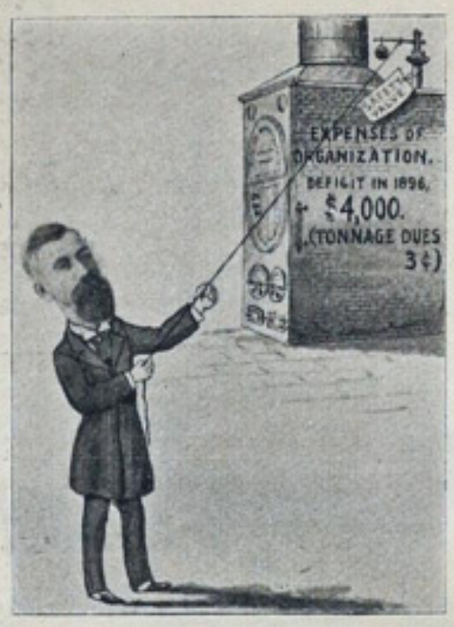
Capt. McDougall says there is no 20 feet in the Sault river.

Mr. Keep's report directs special attention to the fact that there is one spot in the Detroit river for which appropriations are lacking. If Ballard's reef and the lower Detroit river are to be brought into harmony with other points where extensive improvements have been made, the work there should be put under the contract system and sufficient appropriations made to push it along as fast as possible. But this question of deep water in the future involves, as everybody knows, several features other than the big dredging contracts. These are referred to in Mr. Firth's communication, which is as follows:

"The subject of lake and harbor levels is one on which there appears to very little reliable information. It involves, of course, consideration of the work that has been done, that is now being done, and that is proposed, in the way of deepening the shallow waterways connecting the lakes. Much has been said in the public press about the disappointment that has followed the effort to deepen these narrow channels. Lake vessel owners are also deeply interested in the operation of the Chicago drainage canal, which it has been asserted by competent authority, may be expected to operate to effect a reduction in the lake and harbor levels of say 7 inches. If this is to be the result it is a matter of national and international importance. My thought is that the meeting would do well to appoint a special committee to take this subject in charge, communicating and co-operating with the general government in bringing about such an exhaustive examination of the question as may lead to a better general knowledge of the subject and the best possible method of proceeding in any future work that is done. My intention is that the work of this committee should extend beyond the mere deep water channel on the lakes and straits. I think the committee should ascertain the exact present situation with respect to the depth of water, figured from some given datum, and should ascertain the situation in the harbors compared with what may be found in the lakes and connecting waterways. My impression is that few, if any, of the harbors are in condition to take care of vessels of the full draft that would be used in case the 20-foot channel was an established fact. I think, also, this committee should consider all questions affecting the depth of water on the lakes, including the Chicago drainage canal, and that it should try and accumulate information such as would be needed to form an intelligent judgment as to whether or not the water of the lakes is gradually losing any depth as some people imagine. If this is the case, what are the causes and what are the remedies? The committee should be instructed to communicate and act in concert with the United States authorities and try and bring about the publication, at the expense of the United States, of a report with explanatory maps and tables presenting the entire situation. I know of nothing of greater interest to the members of the Lake Carriers' Association than an intelligent consideration of this subject."

It was evident that the matters referred to in this communication would take long and careful work, and a resolution was therefore adopted empowering the president to appoint at his convenience, a special committee, which committee should act under the direction of the executive committee of the association. Later on in the session the president appointed as members of this committee Messrs. E. T. Evans, C. H. Keep and W. A. Livingstone. Still later in the proceedings the subject of water levels came up again when Mr. A. B. Wolvin introduced a resolution, which was adopted, declaring that the Lake Carriers' Association favors the experiment of raising lake levels by means of dams and requesting congress to provide appropriations for preliminary surveys.

It was expected that this meeting of the association would be entirely free from bridge talk but a new bridge scheme, this time in Niagara river, received considerable attention. Representatives of vessel interests at the Tonawandas caused to be introduced, early in the proceedings, a resolution opposing a bill which is now before congress and which provides for the granting of a charter to a private corporation for the erection of an international drawbridge across Niagara river at the head of Grand island, crossing both navigable channels. The number of this bill in the house is 3,555. It is known as the Grand island bridge bill and is now before the committee on interstate and foreign commerce. Opponents of the bill sought action by the convention, as they claimed to be afraid that it would be rushed through congress before the close of the short session now near at hand. Members of the committee to whom the matter was referred were A. B. Wolvin, J. G. Keith, James E. Davidson, R. E. Schuck and A. E. Stewart. Five members of the committee, all but Mr. Wolvin, reported in favor of telegraphing the house committee on commerce that the association protested against the erection of any bridge that would interfere with the free navigation of Niagara river. Mr. Wolvin thought the matter should have been given more careful investigation and was in favor of referring it to the executive committee of the organization. He is against bridges but was, as he said, also against taking the chance of making a mistake that might result in jeopardizing the influence of the association in other matters. Other members argued, however, that the measure might be rushed through congress if action was delayed, and the majority report of the committee was adopted.



Keeping down the tonnage dues.

Mr. Goulder is desirous of having the association informed on the extent of export grain and flour business from the west and southwest that has of late drifted to Galveston, New Orleans and other ports on the Gulf of Mexico, as well as Newport News and other southern Atlantic points. He referred especially, of course, to such of this business as might be expected to take the lake route to the seaboard. On this question the president was empowered to appoint a special committee, which will also be expected to report to executive officers of the organization.

GRAIN HANDLING CHARGES, SHORTAGES, ETC.

The two questions which excited most interest at the meeting—grain shoveling charges and shortages—were not brought before the general body until the last moment, but there was a warm and long drawn-out discussion in the committee room. An effort was made to take the grain shoveling business at Buffalo from James Kennedy and give it to others who offered lower prices, but as had been expected from the start, the vessel owners who were opposed to allowing Mr. Kennedy a big profit on his contract for another year were not united, or at least emphatic enough in their opposition, and when a final vote was taken on the proposition it was practically unanimous in favor of last year's arrangement. J. C. Gilchrist of Cleveland led the opposition, and when a final vote was taken the association went into executive session. Killeran & Co. of Buffalo proposed to do the work at $3.25 per thousand, but the committee reported in favor of continuing the contract with Kennedy at the old rate of $3,50, with the understanding, however, that if a reduction in the price paid to the elevators for steam shovels can be obtained, such reduction shall go to reduce the contract price paid to Kennedy. The president and secretary were authorized to again enter into a contract with Kennedy on these terms, and Capt. J. J. H. Brown, John Kelderhouse and P. P. Miller, all of Buffalo, were appointed a committee to deal with the elevator managers in the matter of trying to reduce the charge of $1.50 a thousand, which is made for the use of steam shovels. Supporters of Kennedy based their efforts in his behalf first

Mr. Goulder, the Peacemaker.

on the danger of a renewal of labor troubles if the contract was taken from him. He had brought about the first reduction that was made in the vessel business. He could go into the grain handling business independent of the association, as it was claimed that certain vessel interests would give him their business and break away from the association on account of a fear of the results if others were given the contract. These and other claims were urged in the committee and in the convention, and the point was made also that a big debt of gratitude was due him from the association. The committee which had this matter in hand will also endeavor later on to secure, if possible, some reduction in trimming charges on grain.

Just before adjournment it was found that the convention had done nothing on the important subject of endeavoring to bring about the adoption of a bill of lading that will cover the questions of grain shortages and detention. It was accordingly decided that the matter should be left in the hands of a committee composed of A. B. Wolvin, W. H. Wolf, J. J. Rardon, A. W. Colton and W. A. Livingstone, to report, if possible, to the executive committee of the association before the opening of navigation in 1897, and if not to the association, at the next annual meeting.

A Cleveland member and his pet.

In the absence of his father, who is now in Europe, Mr. Livingstone invited to the theatre a small party who remained in Detroit on the night of the convention. This is a courtesy extended regularly to the visitors by the Messrs Livingstone, and it is very much appreciated. They are proud of Detroit and they are always thoroughly interested in anything that pertains to the advancement of the city. It was through their efforts that a clause was inserted in the constitution of the association providing that all annual meetings shall be held in Detroit.

LATE ARRIVALS.

Among men connected with the vessel interests who joined the big assembly after the first session were W. L. Sherwood, Mark Hanlon, E. Saeger, E. M. Richardson and Joseph H. Ball of Clevleand, W. S. Brainard of Toledo, John Jenkins and G. W. Parker of Marine City, W. A. Prime of New York, David Adams of Duluth, James Reid of Bay City, John Mullen of Amherstburg, Frank A. Flower of Superior, John Perew of Buffalo, W. H. Holden of Two Harbors, and C. W. Norton, F. A. Ballin, Thomas Adams, A. W. Comstock, Timothy Hurley, Alex McVittie, Col. Kahlman, W. H. Campau and W. R. and H. W. Candler of Detroit.

STEEL FORGINGS.

At the opening session of the convention Mr. H. F. J. Porter, western representative of the Bethlehem Iron Co., extended an invitation to the members to attend an illustrated lecture on "Steel forgings for Marine Engine Parts," which was endorsed by Capt. Millen and accepted by the meeting. The time fixed was 8 o'clock Tuesday evening. The lecture was well attended by those who understood the value of information which Mr. Porter had to give them but there were many in attendance at the meeting who did not hear the lecture and who were sadly disappointed when informed of the interesting features of it. Mr. Porter showed lantern slides illustrating the forge of the Bethlehem Iron company, both outside and in, which he stated was the largest and most complete forge in the world, in which steel forgings only are made. He said that wrought iron, having provəd iteslf to be less reliable than steel, had been replaced by steel first for shapes and structural material, then for plates and now for forgings. He illustrated fully the methods adopted for turning out steel forgings by his company and said that these methods were the same as those in use at the forges of Whitworth and Vickers in England, Schneider in France, and Krupp in Germany. He showed many pictures of representative forgings turned out for engines for street railway power plants, marine engines, pumps, etc., and also work that is done for the government in the line of armor plate and guns. He stated that the price for such work is very little more than for wrought iron forgings. A picture of a broken wrought iron marine engine shaft was shown, representing very clearly the flaw which had occasioned the break, and it was said that this break had resulted in laying the vessel up for the balance of a busy season. He referred also to a list of seventy accidents to lake vessels due to breakage of engine parts, with the cost of repairs, and called attention to the breakage of crank pins, the resulting damage amounting in some cases to $5,000. Those who attended the lecture expressed their delight in having had an opportunity to learn what can be done in this country and regretted that more of the members of the association had not been able to attend. Capt. Millen at a later session spoke of the lecture in the highest terms and said he hoped Mr. Porter would favor the association next year with a repetition of it, assuring him that he would have a full house at that time.

Duluth Tug Matters.

An article elsewhere in this issue refers to the plans of Barry Bros. of Chicago and Capt. James Davidson for establishing a tug line at Duluth. It has been learned since this matter was written that the creditors of Capt. Inman, some of whom are shrewd Duluth business men, may place their interests in a stock company, over which they will exercise supervision, and again place Capt. Inman in the tug business. This means that thereis nothing positive about the Barry Bros. getting any of the Inman tugs, and neither is the deal between hem and Capt. Davidson absolutely tied up. The tug which Capt. Davidson built and sent to Duluth last fall, and which was fitted with engines of the Belle Cross, is now owned by Hawgood & Avery, who were the owners of the engines and who purchased the hull.

In General.

Feb. 3 is the date fixed for the launch of the steamer Crescent City at Chicago.

Capt. David Vance of Milwaukee has left on his regular winter European trip.

Capt. Gibson who has been in the wooden steamer Panther, has been engaged to sail the steel steamer E. C. Pope next season.

Wm. B. Cady of Sault Ste. Marie is to take up a partnership in the practice of admiralty law with John Shaw of Detroit.

Affairs of the dry dock association of the lakes for the coming year will be fixed up at the annual meeting to be held in Chicago on the 20th inst.

The grand lodge Ship Masters' Association, meets at the Ebbitt House, Washington, D. C., on the 19th inst. The annual meeting of the national organization of the Marine Engineers Beneficial Association opens on the 18th also in Washington.

The Thompson Towing and Wrecking Association is rebuilding the tug Mary Virginia, at Port Huron, Mich. Wickes Bros., Saginaw, Mich., are building a new boiler for her. The Lorenzo Dimmick is also being reubilt at the Thompson yard.

Capt. Charles Irving, aged eigthy-one years, whose death is announced from Windsor, Ont., is said to have been one of the first navigators to take a vessel from Lake Huron to Lake Superior before a canal of any kind was built at the Sault. He is also given credit for having established the first line of ferry steamers beween Windsor and Detroit.

Corrigan, McKinnie & Co. have made arrangements with Oglebay, Norton & Co. to handle the bulk of the ore product of the Buffalo group of mines. Both concerns are ore sales agents in Cleveland. Oglebay, Norton & Co. have been wanting ore of the kind produced from the Buffalo mines to make up their assortment of ores, and the arrangement is said to be advantageous to both interests.

The report of the commission on deep waterways from the lakes to the ocean is now in the hands of President Cleveland, and until he has accepted it none of the information may be published. It is said, however, that the report endorses the ship canal project, recommending a depth of 26 to 30 feet, sufficient to accommodate ocean steamers. An appropriation of $250,000 for the purpose of a preliminary survey is asked.

On Jan. 1 Calvin Carr of Chicago left the firm of Carr & Blair and joined C. W. Elphicke & Co., taking a place made vacant by the retirement of Amasa Fitch. Capt. Carr will certainly increase the influence of C. W. Elphicke & Co. He has a large clientage and a great many friends, gained through sound business methods, during more than twenty years of experience in the vessel business at Chicago. He quit sailing and engaged with Wiley M. Egan in 1874. Later he became a member of the firm of Keith & Carr, and still later joined Mr. Blair, with whom he has been associated for the past four years.

MARINE REVIEW

DEVOTED TO LAKE MARINE AND KINDRED INTERESTS.

Published every Thursday at No. 409 Perry-Payne building, Cleveland, Ohio, by John M. Mulrooney and F. M. Barton.

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Entered at Cleveland Post Office as Second class Mail Matter.

The books of the United States treasury department on June 30, 1896, contained the names of 3,333 vessels, of 1,324,067.58 gross tons register in the lake trade. The number of steam vessels of 1,000 gross tons, and over that amount, on the lakes on June 30, 1896, was 383 and their aggregate gross tonnage 711,031.28; the number of vessels of this class owned in all other parts of the country on the same date was 315 and their tonnage 685,204.55, so that more than half of the best steamships in all the United States are owned on the lakes. The classification of the entire lake fleet on June 30, 1896, was as follows:

	Number.	Gross Tonnage.
Steam vessels	1,792	924,630.51
Sailing vessels and barges	1,125	354,327.60
Canal boats	416	45,109.47
Total	3,333	1,324,067.58

The gross registered tonnage of the vessels built on the lakes during the past six years, according to the reports of the United States commissioner of navigation, is as follows:

Year ending June 30. 1891	204	111,856 45
" " " 1892	169	45,968.98
" " " 1893	175	99,271.24
" " " 1894	106	41,984.61
" " " 1895	93	36,352.70
" " " 1896	117	108,782.38
Total	864	444,216.36

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC. (*From Official Reports of Canal Officers.*)

	St. Mary's Falls Canal.			Suez Canal.		
	1895*	1894	1893	1895	1894	1893
No. vessel passages	17,956	14,491	11,008	3,434	3,352	3,341
Tonnage, net registered	16,806,781	13,110,366	9,849,754	8,448,383	8,039,175	7,659,068
Days of navigation	231	234	219	365	365	365

* 1895 figures include traffic of Canadian canal at Sault Ste. Marie, which was about ½ per cent. of the whole, but largely in American vessels.

More details of the Carnegie-Rockefeller deal are gradually coming out. It is known positively that Mr. H. W. Oliver of Pittsburg, who owned half of the Oliver mine, has one-sixth of the stock of the new company and will take for the Oliver furnace interests one-sixth of the ore. This is aside from Mr. Oliver's commission, whatever it may have been, as representative of the Carnegie interests in the transaction. It is also reported, but not on positive authority, that the rail freight from the mine to Duluth has been fixed at 80 cents per ton, and that any reduction in that rate is to be equalized by adding the amount of the reduction to the royalty. In other words, the Rockefeller interests get $1.05 guaranteed, as the joint royalty and rail freight. The lake freight is said to be arranged in the following manner: The Carnegie interest pays a fixed minimum rate per ton through the season and agrees to make a final settlement on the basis of the average rate of lake freight paid to vessels generally during the season. The bonus of $600,000 is said to represent moneys expended in opening up, stripping and equipping the Mountain Iron mine. It will be noted, therefore, that the Rockefeller party secures a minimum tonnage of 1,200,000 tons per annum for their road and steamers, are guaranteed the royalty, and have refunded the whole cost of the mine to them. The Carnegie company has also agreed not to become connected with any competing line from the Mesabi deposits to shipping port, and are not allowed to sell any of their ore in open market.

Although it is not probable that anything will be done in contracts for moving ore next season until well on towards the opening of navigation, it is quite certain that lake freights will be low. The leading ore shippers of Cleveland talk of a rate of 80 cents or less from the head of Lake Superior. They base this opinion on the general tendency towards lower costs in producing iron and steel, which is best indicated by the recent Rockefeller-Carnegie ore and transportation deal. Pools and combinations of the kind that have aimed to include iron manufacturers of all kinds, big and small, will be brushed aside, and business will be done largely on the principal of "survival of the fittest." It is even doubtful whether the Bessemer iron ore association, which was thought to be more solid than some of the other pools, will exist another year. But in this drift to low costs of material there is promise of a big business later on in 1897, and the prospects of an export trade are now demanding great attention from the leading manufacturers. Southern iron makers are jubilant over large sales of pig iron for export, made within the past ten days, one order aggregating 10,000 tons. The Carnegie company is evidently paving the way for the sale of its products in the leading markets of the world, and other manufacturers must place themselves in a position to meet the competition, notwithstanding some advantages which the leading Pittsburg interest will have over all comers. This will not be done by a reduction in labor which is already low, but mainly by reductions in transportation charges and by lower prices on ore and coke.

Erastus Wiman has incorporated the canal company in which he proposes to consolidate the interests of a large number of Erie canal boat owners and also include a fleet of new wooden canal boats. He has some good names in the list of incorporators, among them Charles A. Pillsbury of Minneapolis, Bradford C. Church of Duluth, Elbert A. Young of St. Paul, George H Raymond and Frank Beadle of Buffalo, Samuel B. Hart of Englewood, N. J., and Frank Edson and John A. Cormack of New York.

Admiralty Cases in Cleveland.

Mr. H. F. Carleton, clerk of the United States district court at Cleveland announces that the following cases on the admiralty docket of the court will be called at 10 a. m., Feb. 2: Willaim T. Baker vs. tug Thomas Quayle; A. A. Pinot vs. tug Patrick Henry; S. A. Murphy vs. tug International; William J. Murphy vs. tug International; George Roakes vs, schooner Emma C. Hutchinson, et al.; A. C. Chapman vs. John Corrigan and X. C. Scott; H. D. Turney et al., vs. steamer Wocoken; S. E. Leonard et al vs. tug Griffin; Louis Hausen et al vs. about 180 cords of pulp wood; John Peet et al vs. schooner Monticello; F. B. Hower vs. steamer W. P. Thew; E. M. Bennett vs. steamer Minneapolis; Albert Van Dusen vs. steamer Forest City; John Dolbear vs. steambarge W. P. Thew; Andrew Anderson vs. schooner John Martin; Paul Olson vs. schooner J. S. Austin; L. A. Ranney et al vs. Berghold Glatz; John McLaughlin vs. steamer State of New York; Thomas Kelley vs. schooner Julia Willard; Lulu Belle Gray vs. the City of Cleveland; Ernest Tanner vs. steamer Montana; Charles Hughes vs. steamer Post Boy; James H. Normand et al vs. steam tug W. G. Harrow; P. Werner et al vs. tug C. E. Benham; Joseph C. Gilchrist et al vs. steamer Colgate Hoyt; M. A. Bradley et al vs. barge No. 117; Hawgood & Avery Transit Co. vs. steam propeller A. D. Thompson; Hawgood & Avery Transit Co. vs. the City of Cleveland; Frank Laughlin vs. steamer Montana; C. L. Parker et al vs. the Cleveland, Cincinnati, Chicago & St. Louis Ry. Co.; William Chisholm et al vs. the City of Cleveland; River Machine & Boiler Co. vs. steamer Favorite; Cleveland Sand & Gravel Co. vs. steamer Swan and Theo. Henderson; R. O. Mackey and A. B. Mackey vs. steamer George F. Williams; L. P. Smith and J. A. Smith vs. steamer Rube Richards; American Steel Barge Co. vs. steamer Philip Minch; Chase Machine Co. vs. steamer Maggie Duncan; R. J. Cram vs. the City of Cleveland; Cleveland Saw Mill & Lumber Co. vs. propeller Havana; United States vs. steamer State of Michigan; Merrit Downer vs. steamer Favorite; C. R. Jones vs. schooner Sweepstakes; John Leighton et al vs. schooner Surprise; Bessie Gray vs. schooner Montgomery; Daniel McKinnon vs. schooner H. G. Cleveland; Harris W. Baker vs. schooner Lone Star and cargo; River Machine & Boiler Co. vs. steam tug Jose.

Duluth's New Tug Line.

Capt. James Davidson of West Bay City will be interested with the Barry Brothers, five or six of whom control the Independent Tug Line of Chicago, in the establishment of a new tug line at Duluth next spring. The report that Mr. A. B. Wolvin, Mr. Tomlinson and others of Duluth were to organize a new Duluth tug line was without foundation. Barry Bros. will organize the new company, which will be known as the Duluth Towing and Wrecking Co. They have made arrangements to buy from Capt. Davidson the two new wooden tugs, which he has just completed, and also the new tug which he sent up to Duluth late last fall for the Inman line. They have also about completed arrangements with Duluth banks for the purchase of two or three of the best of the Inman tugs which are under indebtedness, and will have in all a fleet of six or seven tugs at Duluth shortly after the opening of navigation next spring. Capt. Davidson will probably get a liberal price from the new company for his three tugs, as he will be interested in the company and give his towing business to the line.

Traffic of Portage Lake Canals.

It is quite probable that even among vessel owners who are well posted on the volume of lake commerce there was little thought of the commerce of Portage lake ship canals exceeding a million tons. And yet it is found from official reports that 3,568 vessels passed through these canals during 1896, carrying 1,041,933 net tons of freight, against 3,448 vessels and 923,756 tons in 1895. Since the government purchased these canals they have been under the direction of the war department, and the following report of the commerce is published through the kindness of Major Sears of the army engineer corps:

COMPARISON OF COMMERCE THROUGH PORTAGE LAKE SHIP CANALS, MICHIGAN, FOR SEASON OF 1895 AND 1896.

ITEMS.	Designation.	Seasons. 1895.	Seasons. 1896.	Increase, Amount.	Decrease, Amount.
Steam	Number..	2,972	3,068	96	
Sail	" ..	476	500	24	
Tonnage, registered	Net tons..	1,013,660	1,076,548	62,888	
Passengers	Number..	24,809	41,262	16,453	
Coal	Net tons..	329.246	398,964	69,718	
Flour	Barrels...	850,095	774,143		75,952
Wheat	Bushels...	261,210	225,430		35,780
Grain (not wheat)	" ...	67,345	100,533	33,188	
Salt	Barrels...	45,028	99,813	54,785	
Copper	Net tons..	69,904	74.473	4,569	
Iron Ore	" " ..	17.930	16,755		1,175
Pig Iron	" " ..	7,047	8,032	985	
Manftd. iron	" " ..	17,890	14,172		3,718
Lumber	M. ft. B. M	86,235	103.504	17,269	
Logs	" "	31,717	39.115	7,398	
Bldg. stone	Net tons..	10,060	14,674	4,614	
Misc. mdse	" " ..	147,174	127,447		19,727
Total freight	" " ..	923,756	1,041,933	118,177	

Look Out for British Gunboats.

The Canadian Manufacturer, one of the most patriotic of Dominion journals, takes objection in an amusing strain to an article in the Review supporting the efforts of Congressman Burton of Cleveland to bring about a modification of treaty relations between Great Britain and the United States that will admit of war vessels being built on the lakes. The Manufacturer says:

"No doubt it would be of advantage to American lake cities to have national navy yards, dry docks, arsenals, and building sheds, and to have war vessels built there, but would it be desirable? Suppose that Great Britain should accede to the abrogation of that clause of the treaty of 1817, which forbids the having or maintaining of war vessels on the great lakes, and there was no treaty restriction upon the United States doing as Congressman Burton desires, our neighbors ought to know that the policy of Great Britain would be to always answer the call of a rival and for every keel laid, place an equally effective vessel afloat on the adjacent water. Why not let well enough alone? From a British standpoint perhaps it would well to use the lakes as reservoirs in which to store and keep a liberal portion of the vast number of war vessels that are in commission in the British navy. It might serve to suppress some of the bumptiousness of our neighbors who incline to imagine that all the continent is theirs and the fulness thereof. It might be interesting to them to understand that should they slop over at any time and embroil themselves in a quarrel with Canada or any other British possession, their immense fleets of lake freight carriers and passenger steamers, of which they feel so justly proud, would resemble rats in a trap, to be sent like McGinty to the bottom of the sea, while every American lake city would be forced to pay heavy ransom to be allowed to exist, or else be battered into ruins by British cannon. Congressman Burton and his unwise friends had better proceed slowly in their endeavor to abrogate the treaty. It is an open question whether the United States has not already abrogated the treaty of 1817, or as fully determined to do so in the construction at Cleveland of the revenue cutter Gresham, and the proposal to construct two other such vessels at Clevleand or some other lake port."

Mr. E. E. Roberts of the Roberts Water Tube Boiler Co., is visiting lake cities in the interest of his company. Mr. Roberts is one of the few engineers of this country who have a general knowledge of steam yachts. His dealings with yacht owners and yacht builders, in connection with the manufacture of boilers, have enabled him to secure a very thorough knowledge of everything pertaining to the construction and successful management of the best steam yachts in the country.

A Supplemental List.

With the last issue of the Review there was published a list of vessels laid up at different ports around the lakes. The list did not include the Chicago lumber fleet, but any of our readers who are interested in the lumber fleet can now cut out the following list, which is complete as regards vessels laid up in Chicago, and attach it to the supplement:

STEAM VESSELS.

Adams, Tom.
Arizona.
Berlin, City of.
Bielman, C. F.
Boston.
Buffalo.
Burroughs, George.
Butters, M. F.
Carter, W. H.
Cadillac.
Caledonia.
Calumet, (Cutter.)
Cleveland, City of.
Colgate, James B.
Cranage, Thomas.
Curry, S. S.
Cyclone.
Dahlia, (U. S)
Delaware.
Drake, M. M.
Dunbar, George.
Elphicke, C. W.
Fayette.
Flower, R. P.
Forbes, Kittie M.
Gratwick, W. H.
Hall, C. S.
Haskell, W. A.
Hill, J. J.
Holland, Robt.
Hope, George T.
Iroquois.
James, Henry R.
Jewett, H. J.
Ketcham, W. P.
Lansing.
London, City of.
McVittie, A.
Madagascar.
Marshall, Samuel.
Martin, S. K.
Mecosta.
Merida.
Mills, Robt.
Minch, Philip.
Mitchell, John.
Mitchell, Samuel.
Mohawk.
Moore, John W.
Morley, George W.
New Orleans.
Nicaragua.
Niko.
Olympia.
Orr, George N.
Palmer, T. W.
Paris, City of.
Parnell, C. S.
Pentland.
Perue, Hattie B.
Plankinton, John.
Prentiss, J. H.
Prince, F. H.
Ramapo.
Reitz, Chas.
Rhodes, R. R.
Rome, City of.
Sachem.
Samoa.
Saranac.
Scranton.
Schuylkill.
Soper, Albert.
Spry, John.
Tampa.
Thompson, A. D.
Thompson, Emma.
Venice, City of.
Viking.
Waldo, L. C.
Wescott, J. W.
Whitney, D. C.
Worthington, H. L.

SAIL VESSELS AND BARGES.

Alice.
America.
Ames, Cheny.
Apprentice Boy.
Ashland.
Barnes, Bertha.
Blake, E. R.
Blaine, James G.
Boice, George J.
Boice, Jessie L.
Bronson, T. J.
Brown, Bell
Burton, L. A.
Butcher Boy.
Calkins, Bertie.
Campbell, Ralph.
Cape Horn.
Celtic.
Chicago, City of.
Churchill.
Collins, Mary.
Commerce.
Connelly Bros.
Cook, M. E.
Cora A.
Dall Maggie.
Driver.
Elgin.
Filer, D. L.
Filer, G. M.
Ford River.
Forest, I. M.
Four Brothers.
Gifford, F. W.
Goodman, W. O.
Grampian.
Guido.
Hackley, C. H.
Halsted.
Herschel.
Hinchman, K.
Howland, Thomas.
Hutchinson, E. C.
Hutt, Hattie.
Iron Queen.
Johnson, O. R.
Johnson, J. T.
Jones, J. V.
Jones, Wm.
Jura.
Kanters, R.
Keith, Ida.
Lake Forest.
Lawson, Iver.
Lookout.
Lotus.
Lyons, Kate.
Mcgill, C. J.
McLachlan, M. E.
Mark, John.
Maria, Ann.
Marsh, G. A.
Martin, D. R.
Meade, J. H.
Mediator.
Medora, Ada.
Mee, John.
Merrill, J. B.
Michelson, C.
Michigan.
Middlesex.
Minch, C. P.
Minch, Sophia.
Miner, John.
Moravia
Morkey, A. G.
Mosel.e.
Mosher, A.
Moss Truman.
Mott, Richard.
Mowry, A. J.
North Cape.
Naghtin, George W.
Nau, Libbie.
Neil, Annie.
Norman.
Oak Leaf.
Olga.
Owen, George B.
Paisley.
Parana.
Penobscot.
Phillips, Jessie.
Phorine, Annie.
Plymouth.
Rabb, Charlotte.
Radical.
Resumption.
Richmond, H. A.
Rising Star.
Scotia.
Seamen.
Sea, Gem.
Sheboygan, City of.
Slauson, M.
Stafford.
Stampede.
Stanton, E. M.
Steele, George.
Stephenson, S. M.
Sturges, George.
Tabor, H
Taylor, J. V.
Three Bells.
Vega.
Vermont.
Warmington, G. H.
Wayne.
Wilbor, J. B.
Williams, Ellen.
Wilson, T. C.
Wing, Winnie.
Winslow, H. C.
Wonder.
Wood, S. A.
York State.
" 130"
" 134"

Just as we retire our naval officers at a fixed age, so also does the French navy retire its war vessels. Wooden ships of sixteen to eighteen years and iron ones of twenty-five to twenty-eight years of age are passed upon by a sort of coroner's jury from the admiralty. If a vessel is condemned no good money is thrown away in repairs, as she is promptly sold or broken up. Formerly the minor powers, such as the South American republics, used to buy up these old war vessels, but they were found to be dear bargains. One of them, a cruiser built at a cost of a million and a half francs, was sold for fire-wood recently, fetching 30,000 francs.

9,934,446 TONS FOR 1896.

LAKE SUPERIOR IRON ORE PRODUCTION—OUTPUT AND SHIPMENTS SHOWN BY MINES, RANGES AND PORTS.

The output of iron ore from the Lake Superior region for 1896, as shown by the following tables, is about one-half million tons less than in 1895. The Mesabi range leads all others, but shows an increase of only about 100,000 tons over the previous year, while the Marquette range increased over 500,000 tons. The Gogebic and Menominee ranges show a decrease of 748,005 and 363,331 tons respectively. The Oliver mine of the Mesabi range takes first place as a producer with 808,291 tons, the Lake Superior leading the Marquette range with 459,576 tons, the Chapin the Menominee range with 420,318 tons, the Norrie the Gogebic range with 329,068 tons, while the Minnesota and Chandler mines turned out 448,707 and 471,545 tons respectively. Escanaba is ahead in the list of shipping ports and Duluth is second.

SHIPMENTS BY RANGE FOR 1896 AND FOUR YEARS PREVIOUS.

Ranges.	1896, Gross tons.	1895, Gross tons.	1894, Gross tons.	1893, Gross tons.	1892, Gross tons.
Mesabi	2,882,079	2,781,587	1,785,839	613,620	4,245
Gogebic	1,799,971	2,547,976	1,834,086	1,329,464	2,971,991
Marquette	2,603,839	2,097,838	2,049,107	1,835,893	2,666,856
Menominee	1,560,467	1,923,798	1,137,949	1,466,197	2,261,499
Vermillion	1,088,090	1,077,838	948,513	820,621	1,167,650
Total	9,934,446	10,429,037	7,755,494	6,065,795	9,072,241

SHIPMENTS BY PORTS, 1896 AND THREE YEARS PREVIOUS.

Ports.	1896, Gross tons.	1895, Gross tons.	1894, Gross tons.	1893, Gross tons.
Escanaba	2,321,931	2,860,172	1,644,770	2,048,981
Ashland	1,566,236	2,350,219	1,738,590	1,117,524
Two Harbors	1,813,992	2,118,156	1,373,253	903,329
Duluth	1,988,932	1,598,783	1,361,043	440,292
Marquette	1,564,813	1,079,485	1,424,856	1,093,774
Superior	167,245	117,884	.....	80,273
Gladstone	220,887	109,211	79,108	203,585
All-rail	290,410	194,127	133,874	178,037
Total	9,934,446	10,429,037	7,755,494	6,065,795

MARQUETTE RANGE.

Mines	Gross tons	Mines	Gross tons
Cambria	95,086	Negaunee	175,394
Champion	113,375	Palmer	1,041
Cleveland	268,364	Platt	11,296
Dexter	18,903	Primrose	6,040
Grand Rapids	67	Queen	323,057
Hartford	1,532	Republic	127,360
Iron Cliffs	244,755	Richmond	1,088
Jackson	80,710	Star West	9,658
Lake Angeline	344,753	Volunteer	53,216
Lake Superior	459,576	Winthrop	150,496
Lillie	107,532	Total	2,603,839
Mesabi's Friend	10,540		

MENOMINEE RANGE.

Antoine	110,821	Great Western	14,643
Aragon	95,809	Hemlock	94,645
Chapin	420,318	Loretto	34,334
Commonwealth	93,707	Mastodon	60
Columbia	87,202	Millie	21,815
Crystal Falls	44,526	Penn Iron Mining Co	179,917
Cundy (Quinnesec)	3,395	Pewabic	273,587
Delphic	52	Sheridan	3,419
Dunn	47,081		
Florence	35,136		1,560,467

GOGEBIC RANGE.

Anvil	57,483	Newport	142,369
Ashland	91,149	Norrie	329,068
Atlantic	60,727	Pabst	68,984
Aurora	187,169	Palms	114,108
Brotherton	50,490	Pence	13,185
Cary	38,821	Shores	12,196
Chicago	504	Sunday Lake	89,441
Colby	48,492	Tilden	250,205
Eureka	4,544	Windsor	28,154
Iron Belt	81,351		
Montreal	131,531	Total	1,799,971

VERMILION RANGE.

Minnesota	448,707	Zenith	18,765
Chandler	471,545		
Pioneer	149,073	Total	1,088,090

MESABI RANGE.

Adams	234,562	Lake Superior	67,659
Ætna (Lowmore)	17,723	Mahoning	167,245
Auburn	131,478	Mountain Iron (and Rathbun)	142,021
Biwabik	242,565	Norman	77,523
Canton	16,261	Ohio	69,925
Cincinnati	57,324	Oliver (Mis. Mtn and Lone Jack)	808,291
Cloquet (Vega)	96,280	Sellers	153,037
Commodore	22,063	Williams (N. Cincinnati)	11,249
Fayal	248,645	Total	2,882,079
Franklin	231,086		
Genoa	17,136		
Hale	70,006		

Marine Business Men of the United States.

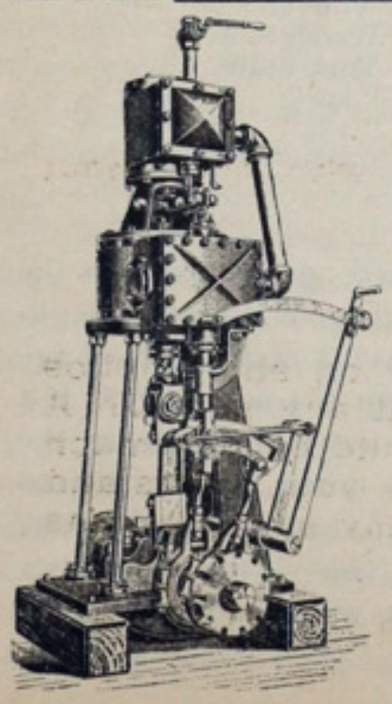
The Review presents in a supplement to this issue the portraits of seventy-two men interested specially in marine business or who furnish machinery, material or some specialty to the men who are. They are with one exception advertisers in the Marine Review, but this supplement has nothing to do with advertising. It is presented as an illustration that will interest our readers. That these men represent some of the leading business concerns of the country is an indication the Review has reached the foremost rank among papers of this kind in the United States. This is further evidenced by the fact that a considerable number of them use the Review extensively to reach their customers.

Philip Minch of Cleveland, manager of the vessels of the Minch estate, has purchased from Capt. James Davidson of West Bay City the schooners Dundee and Aberdeen, which he had under charter during the past season. Palmer & Co. of Cleveland made the sale, and the consideration is said to have been $40,000 each. The Dundee will tow with the steamer H. A. Tuttle and the Aberdeen with the John N. Glidden.

Capt. James Davidson will build for Barry Bros. Chicago line, before the opening of navigation next spring, a tug of 80 by 20 by 11½ ft. dimensions, which will be supplied with a new boiler of 160 pounds pressure from Chicago, and an old double high pressure engine, which has cylinders of 18 inches diameter and 22 inches stroke. The new tug for Chicago, which will be worth probably $15,000, will increase the fleet of the Independent line to nine vessels.

The Jenks Ship Building Co. of Port Huron offers for sale the wooden steamers Linden, Runnels and Porter and the barges Cahoon, Brainard and Maxwell.

MARINE ENGINES.



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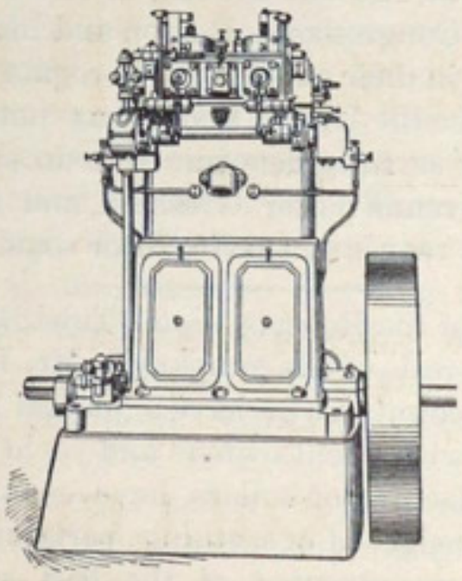

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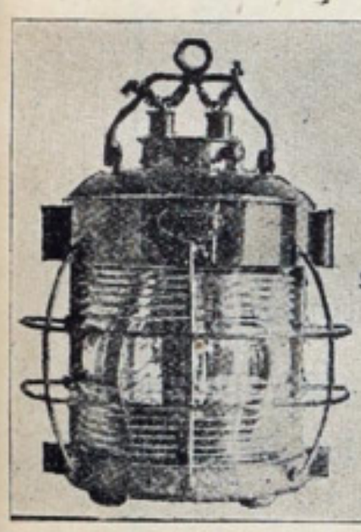

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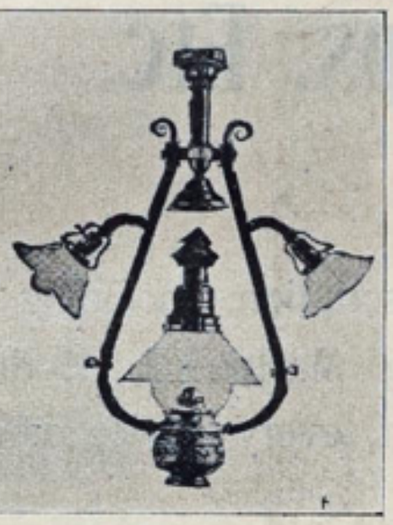

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Number of Men Employed, about 6,000 in all departments.

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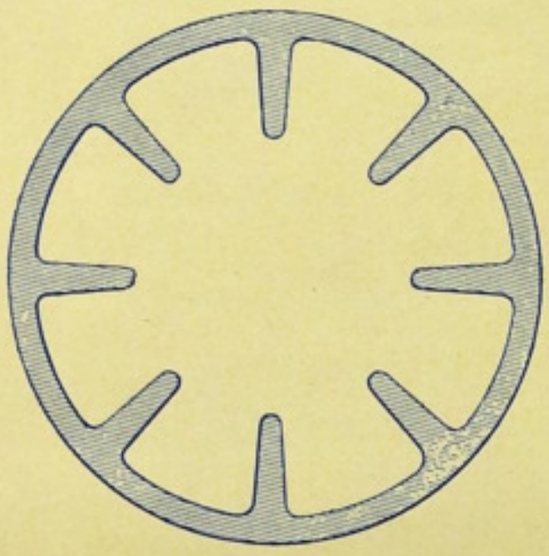
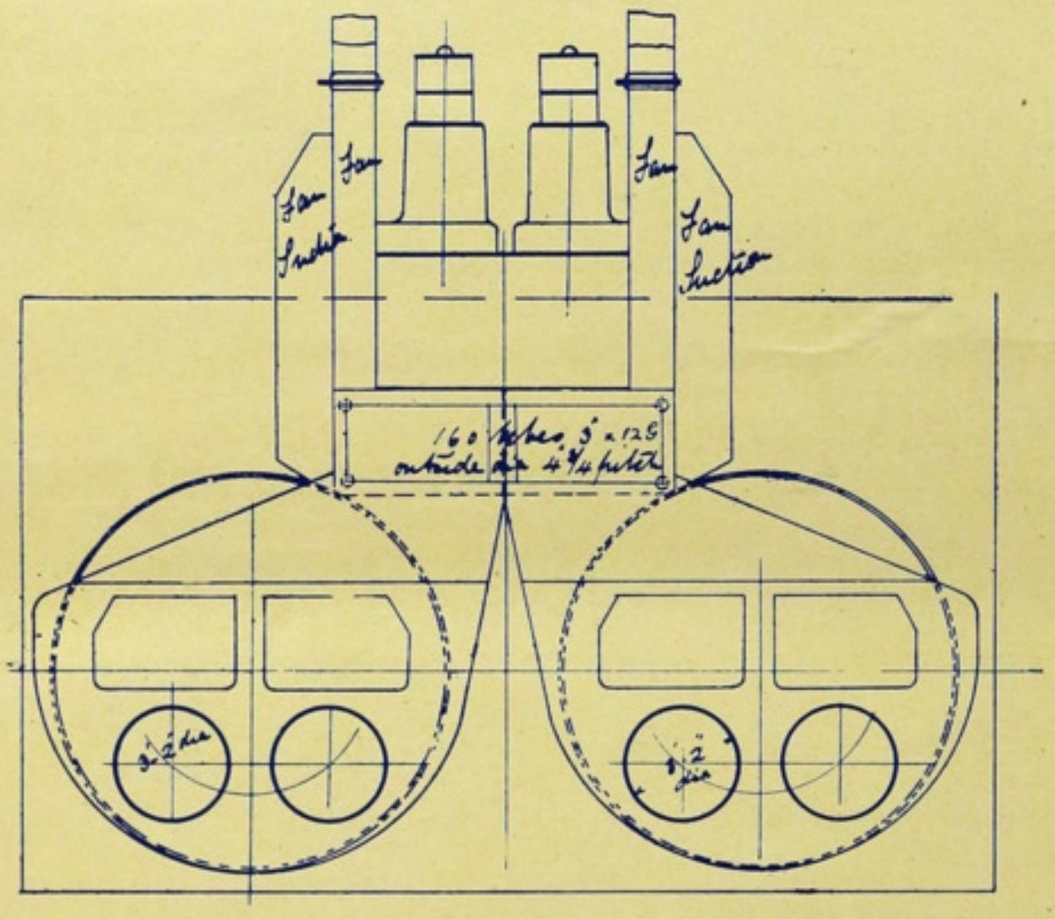
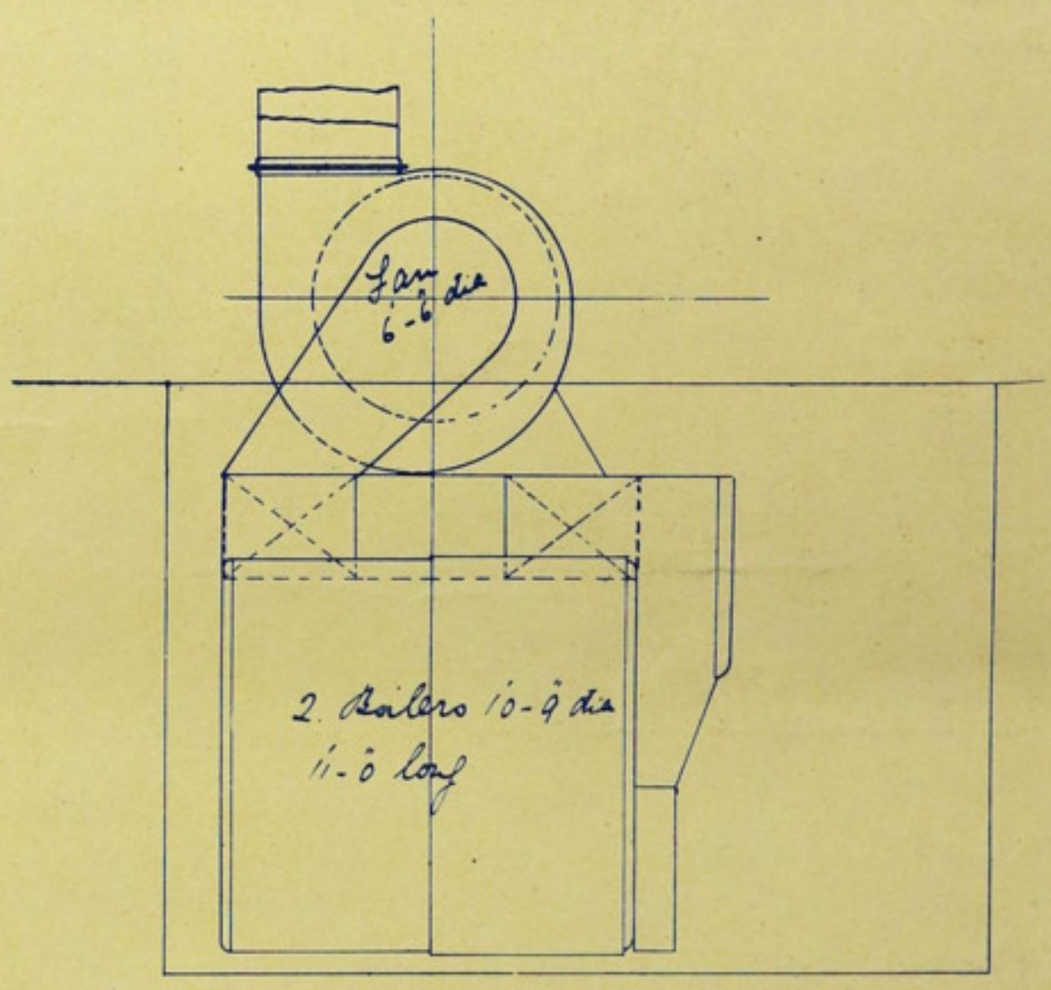


SERVE'S RIBBED TUBES.

Managers of the Trans-Atlantic lines are watching the performance of the steamer on the right, because she burns only 1.22 lbs. coal per horse power per hour. Her boilers are fitted with the tubes shown on the left.

AMERICAN LINER ST. PAUL.





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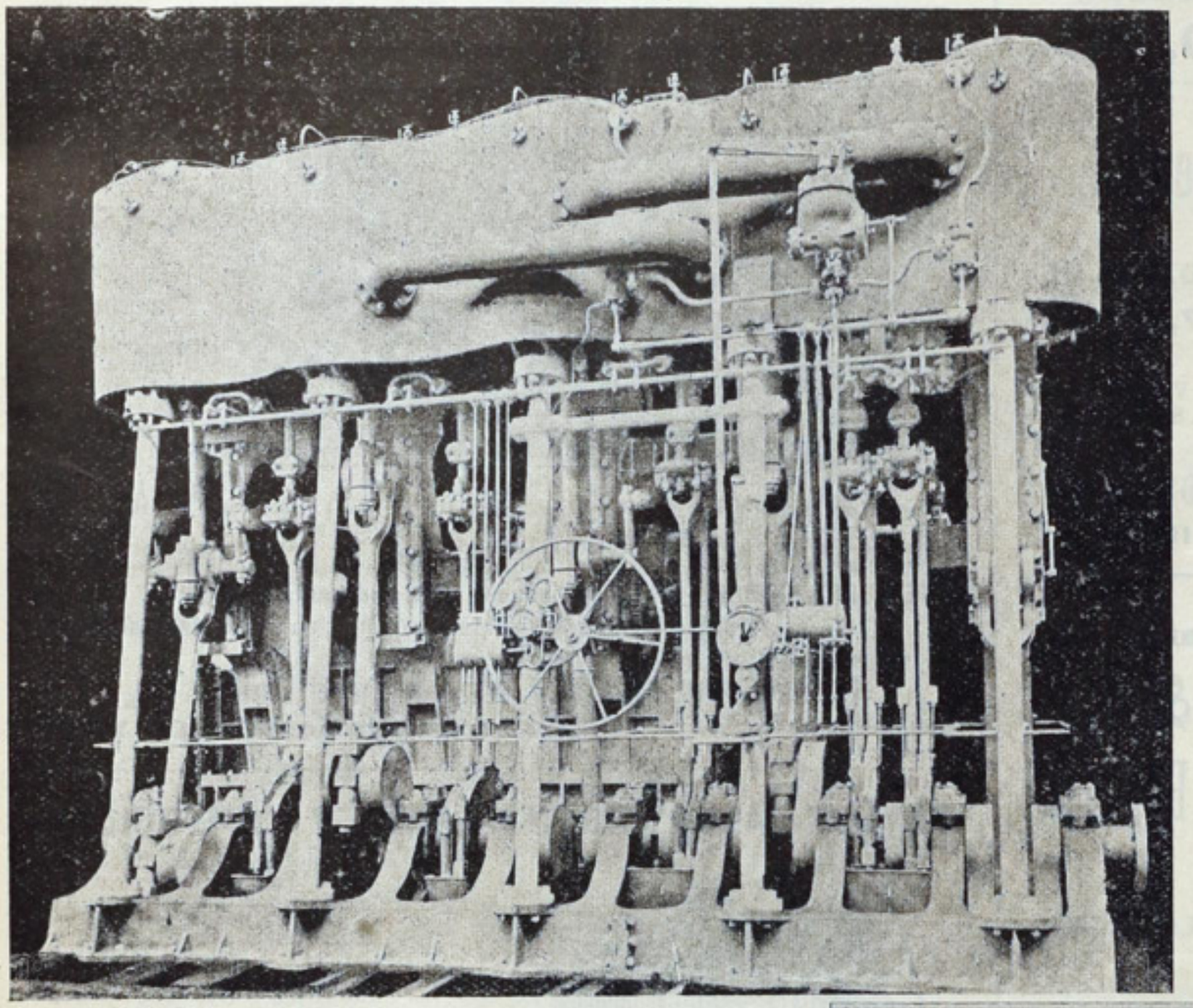


ENGINES OF THE INCHMONA—

Hull, 325 feet long,
46½ " beam,
20½ " draft,

Engines, 17, 24, 34, 42 and 42 x 42 in. stroke.

THE BOILERS ARE FITTED WITH SERVE RIBBED TUBES AND THE ELLIS AND EAVES DRAFT.

This steamer carries 5,000 tons cargo, 9 knots an hour on a daily fuel consumption of 11½ tons coal. This amounts to 1.07 lbs. of coal per horse power per hour, over ½ pound less than the best showing made by any lake steamer with any kind of draft, and the lowest ever obtained in marine practice.

ENGINES OF THE KENSINGTON—
(AMERICAN LINE.)

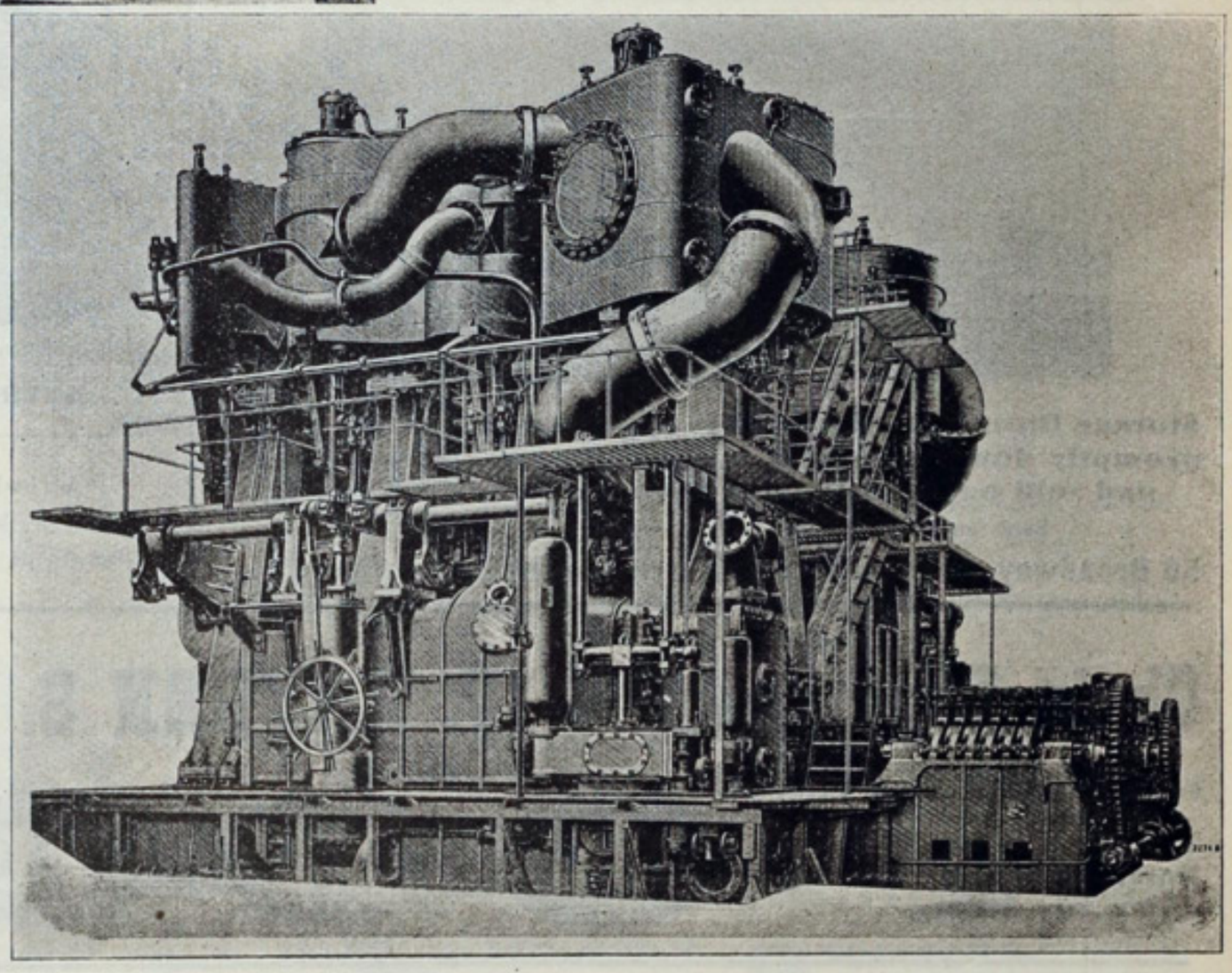
Hull, 480 feet long,
57 " beam,
40 " deep.

Twin Engines, 25½, 37½, 52½ and 74 x 54 in. stroke.

Boilers, Two Double-ended,
15 ft. 9 in. by 21 ft. 5 in.
One Single-ended,
15 ft. 9 in. by 11 ft. 3 in.

FITTED WITH SERVE RIBBED TUBES AND THE ELLIS AND EAVES DRAFT.

Coal consumption per I. H. P. per hour on this steamer is 1.4 lbs. This is ¾ lb. less than the average lake steamer. Her cargo capacity is 10,600 tons.



Serve Ribbed Tubes and the Ellis and Eaves Induced Draft are to be installed in at least two lake steamers during the coming winter,--and it can be guaranteed that these steamers will have a fuel consumption as low as 1½ lbs. per I. H. P. per hour. A result of 1¾ lbs. has been obtained with the Ellis and Eaves Draft and Plain Tubes in the L. C. Waldo.

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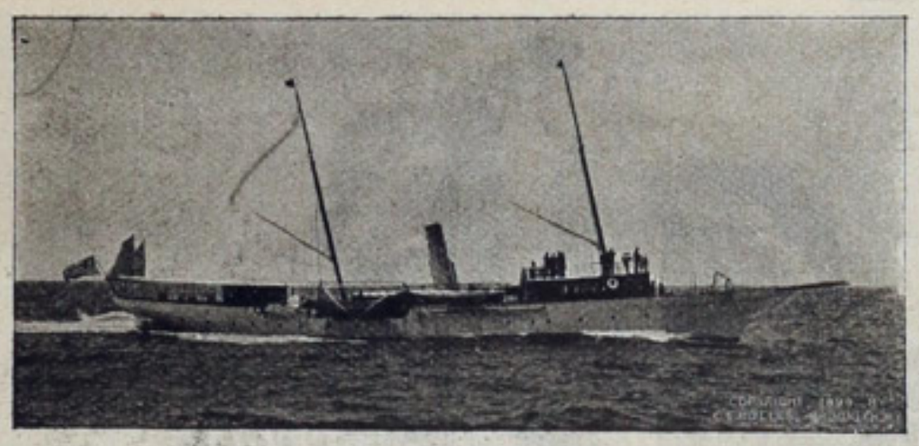

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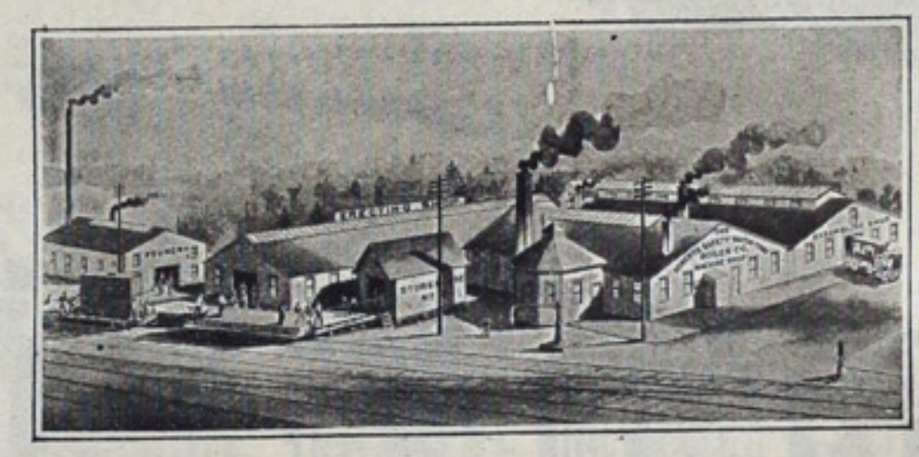

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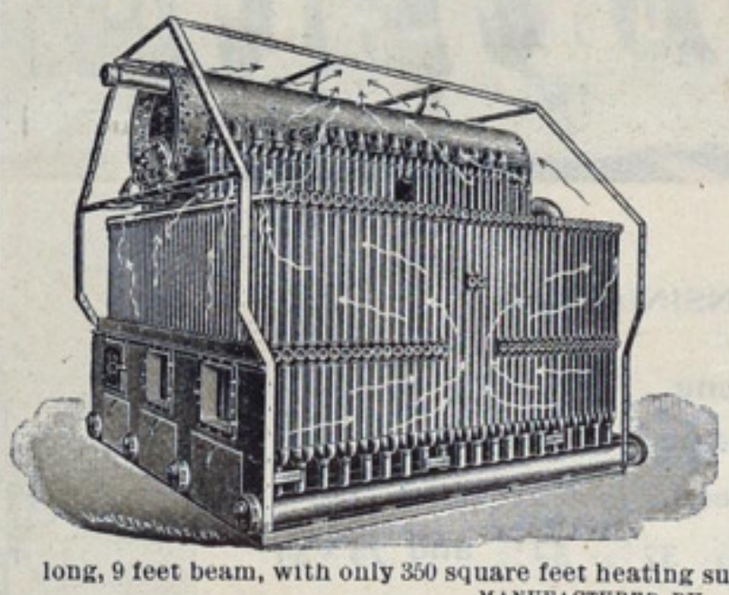

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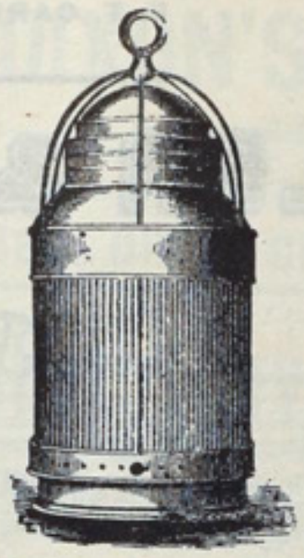

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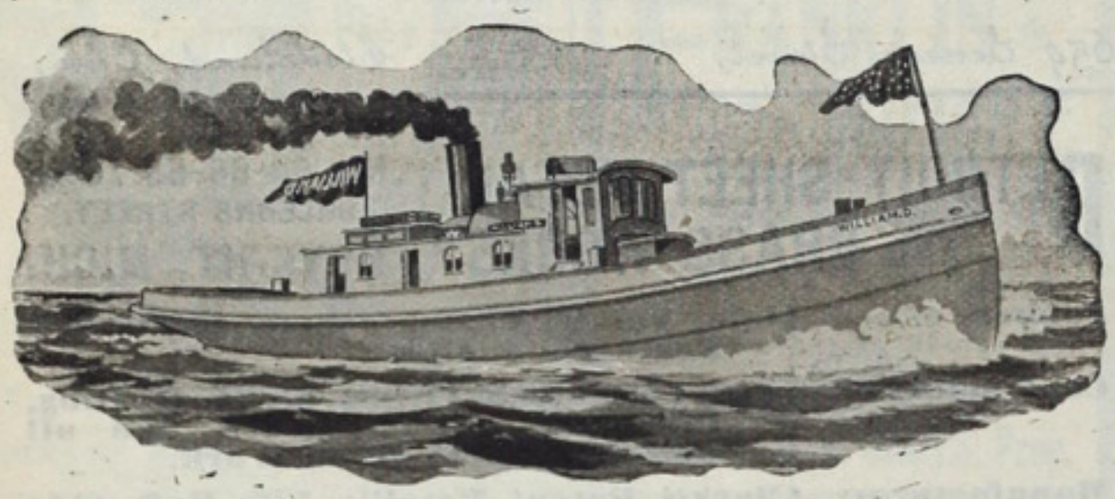

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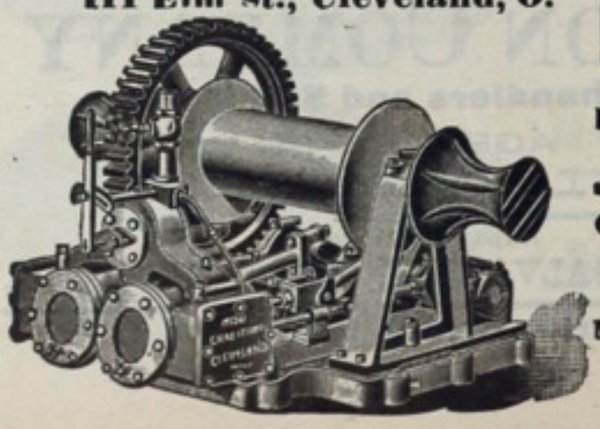

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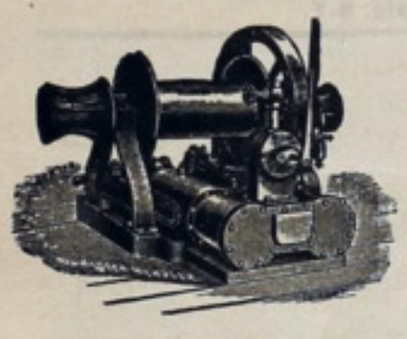

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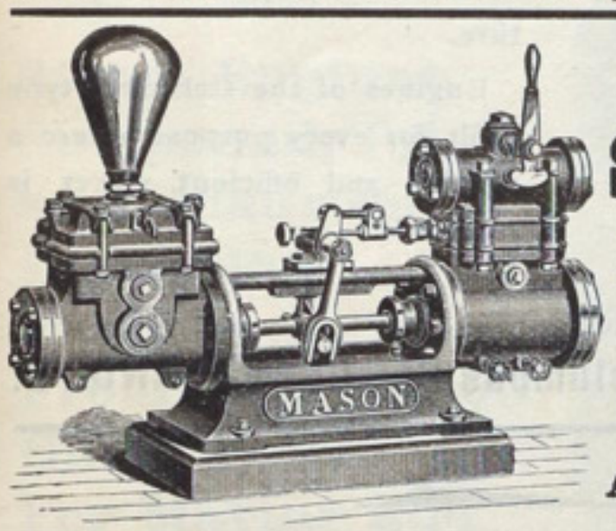

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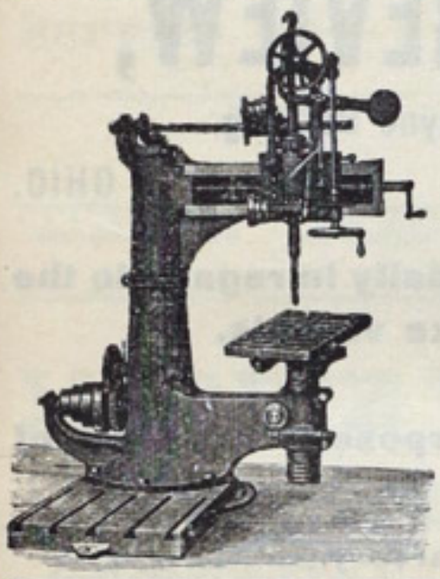

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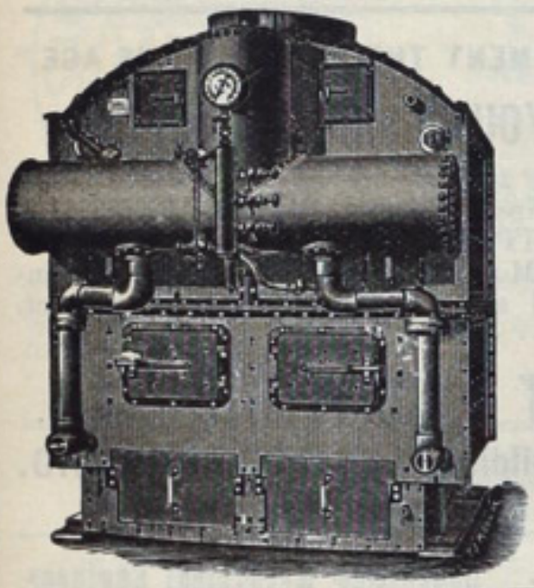

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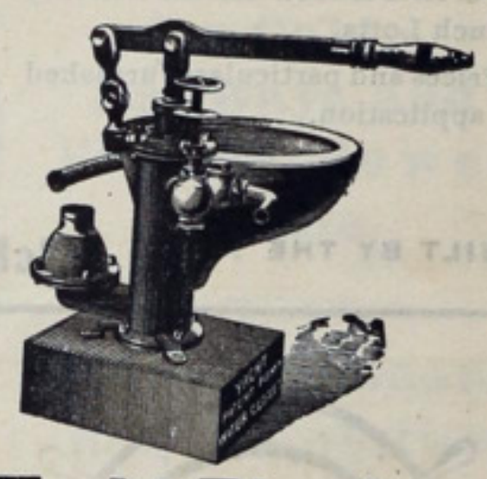

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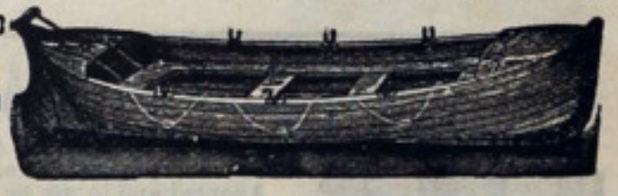

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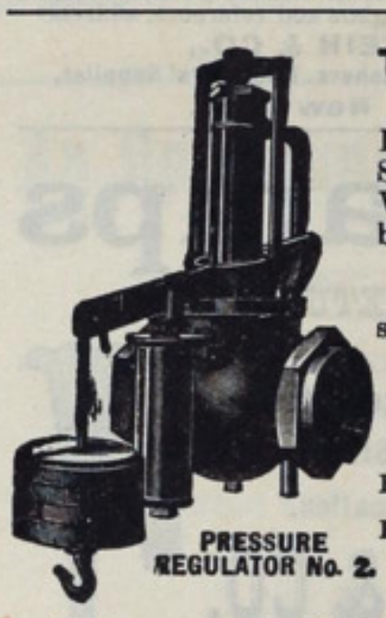

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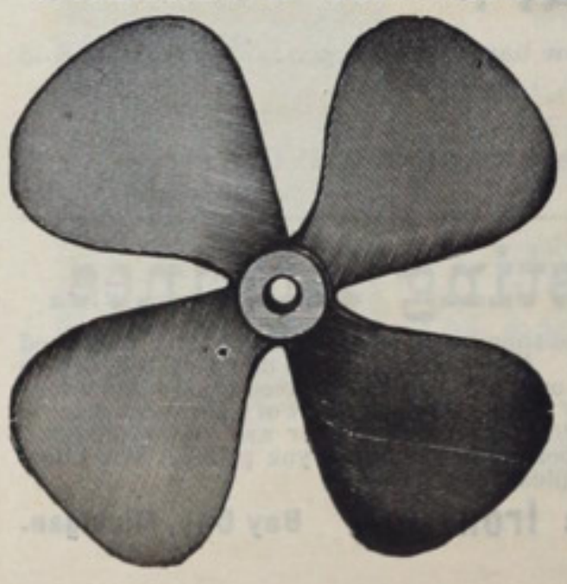

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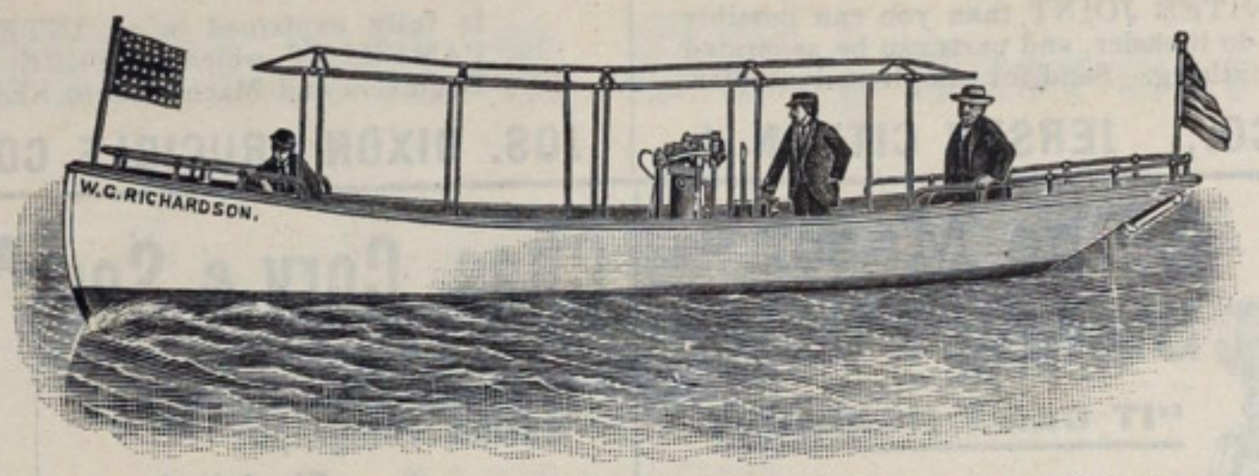

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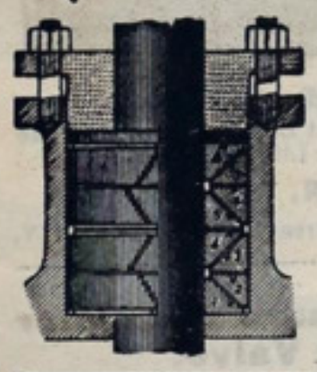

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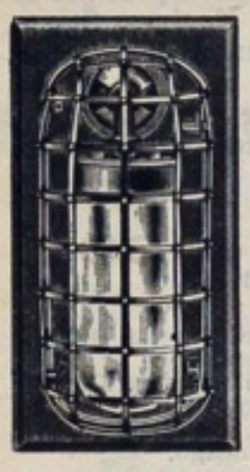

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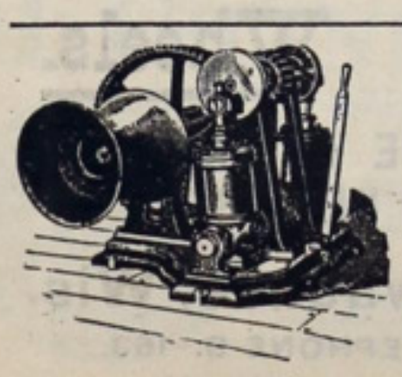

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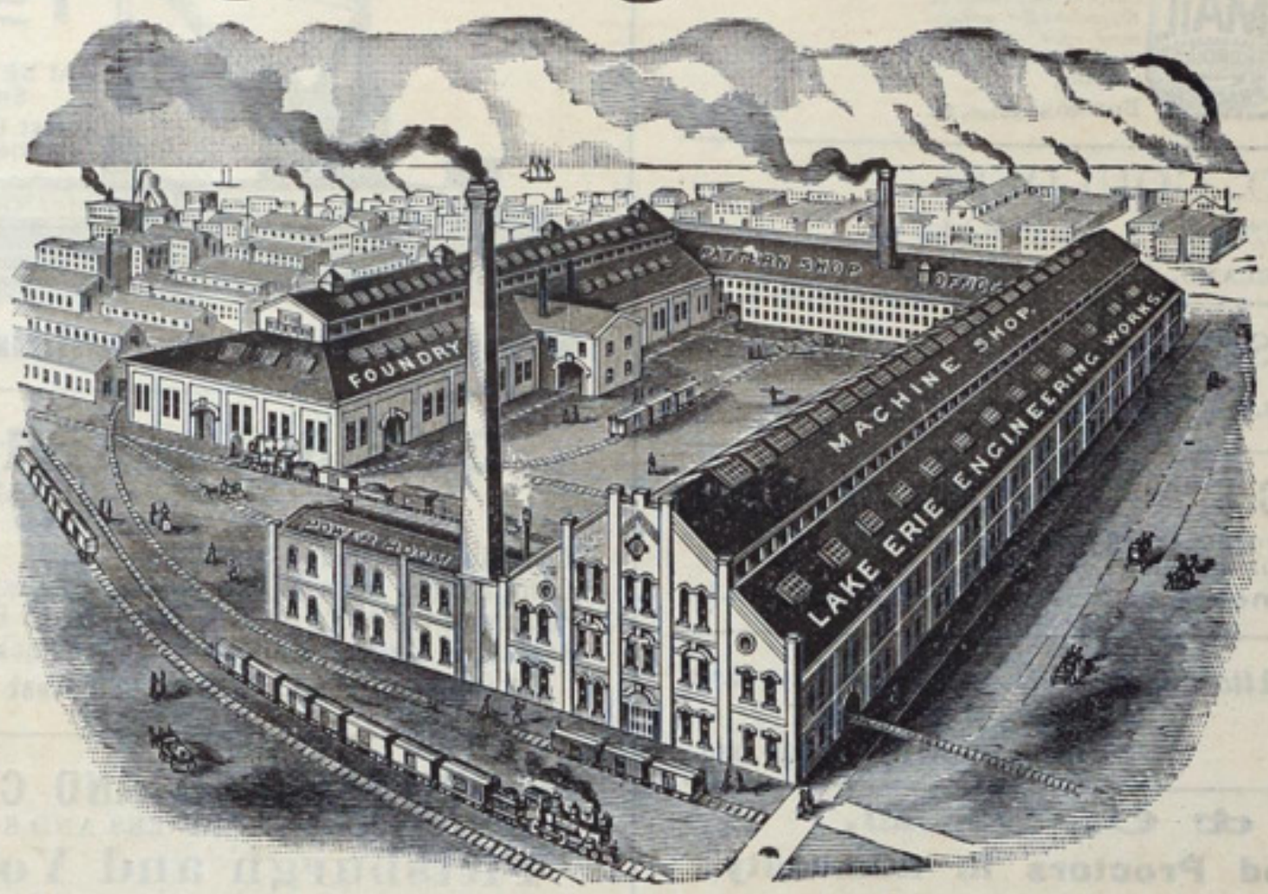

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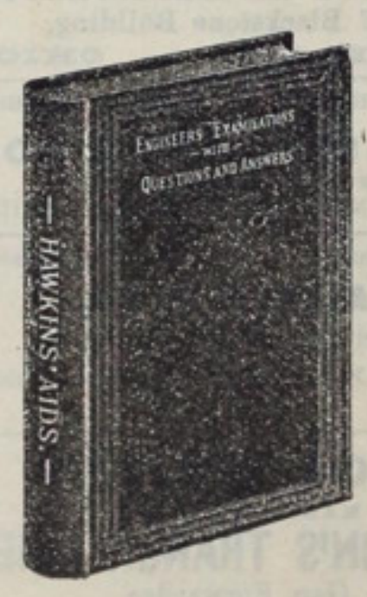

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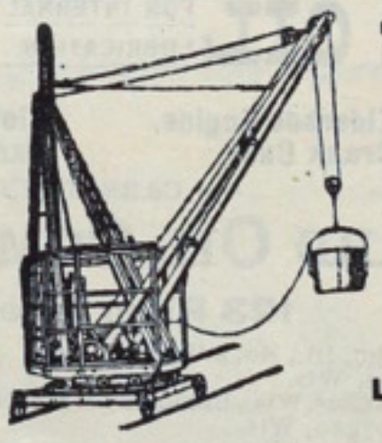

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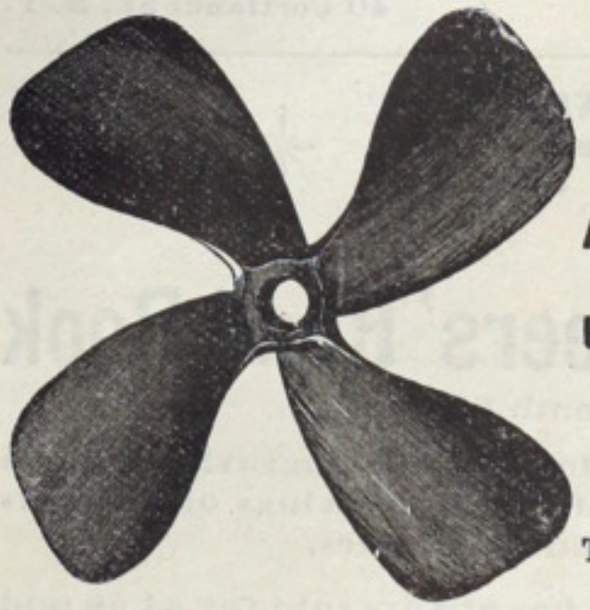

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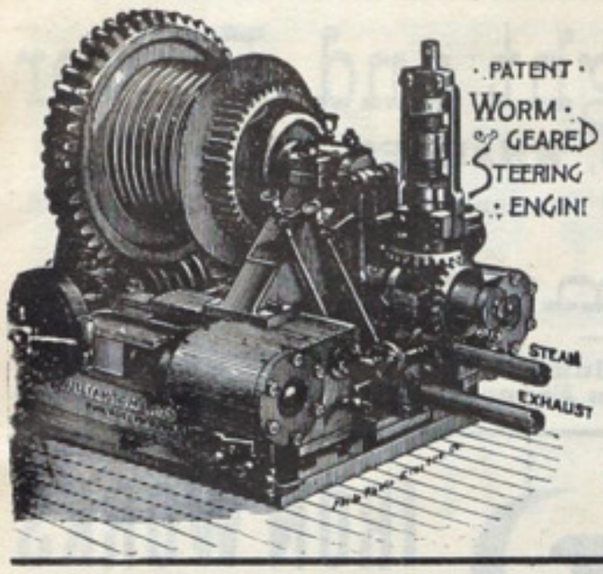

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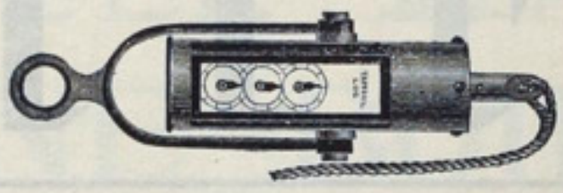

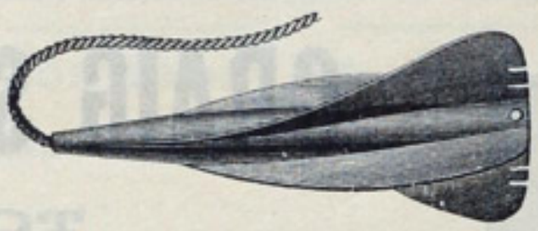

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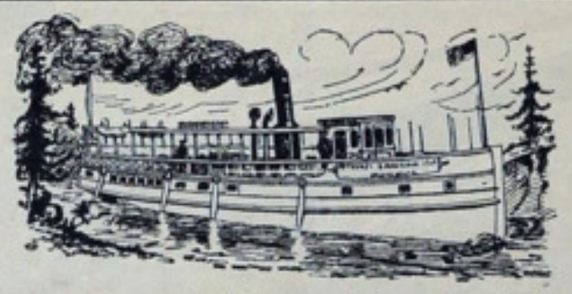

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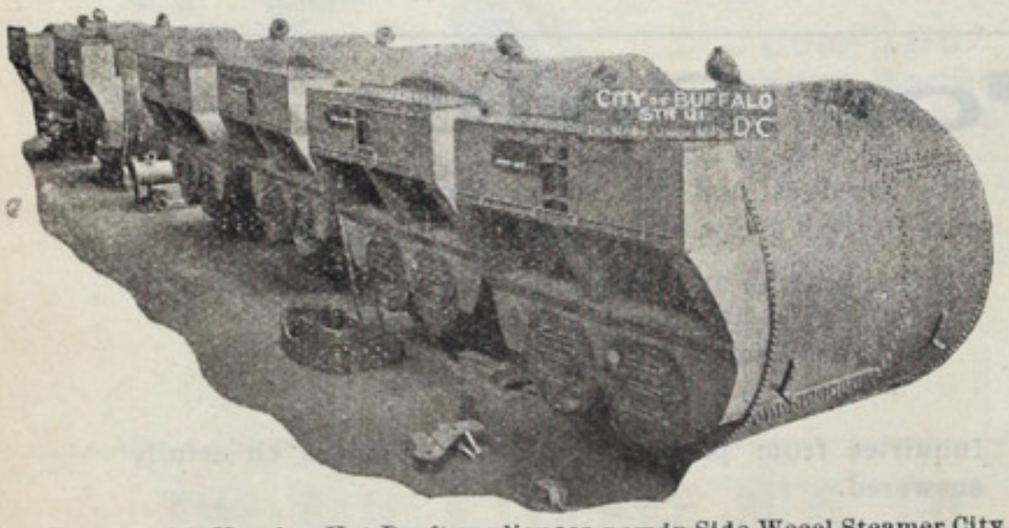

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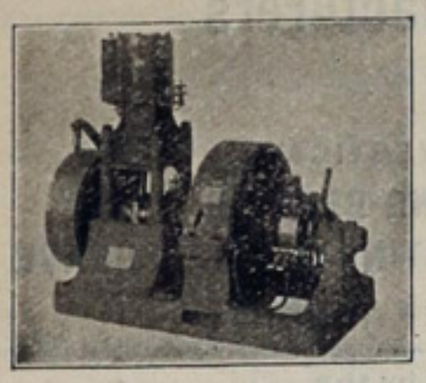

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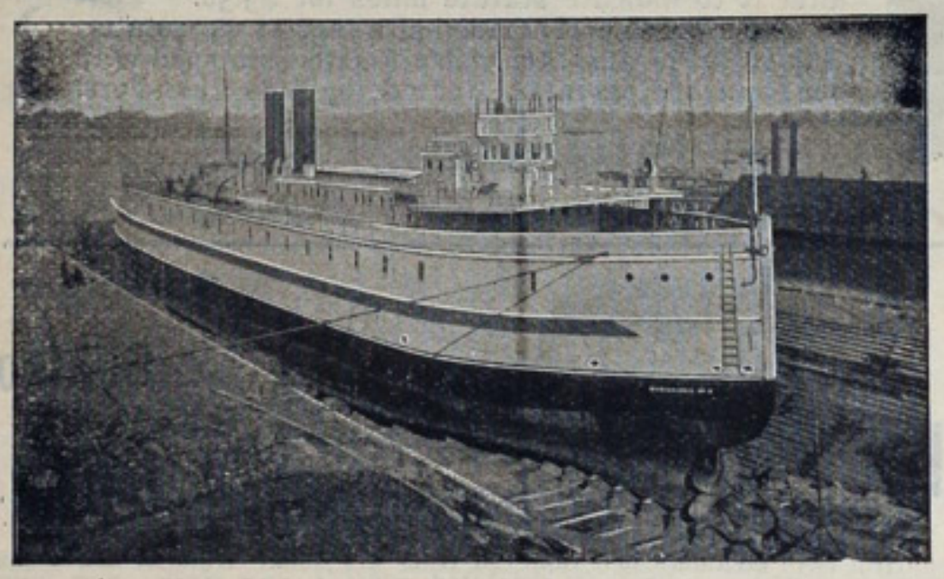

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Application for survey of vessels and subscriptions to Register Book will be received by the surveyors or at the office of

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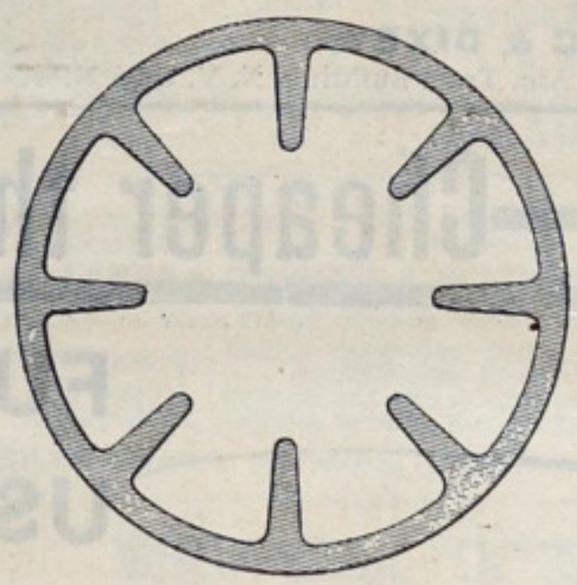

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Two Dredges and six Dump Scows, one Flat Scow, one Derrick Scow and four Tugs—

One with	15	by	17	engine, allowed	110	lbs. steam.
"	"		17	by 16 " "	110	" "
"	"		20	by 22 " "	125	" "
"	"		20	by 24 " "	110	" "

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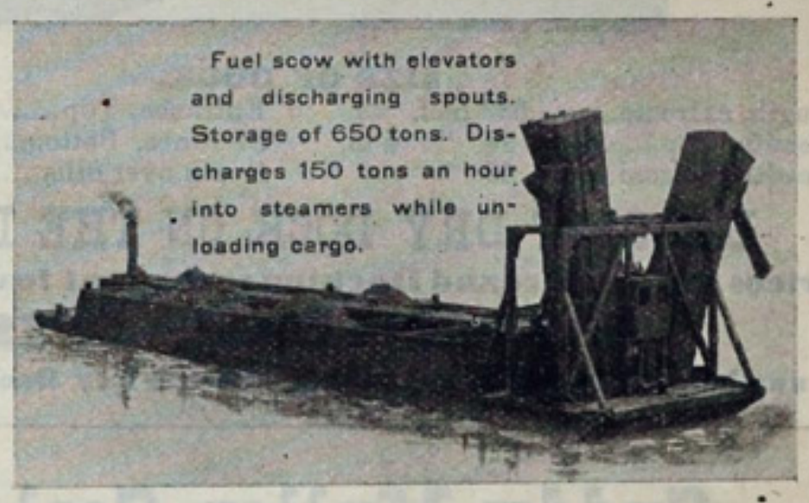

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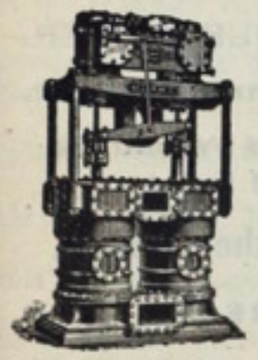

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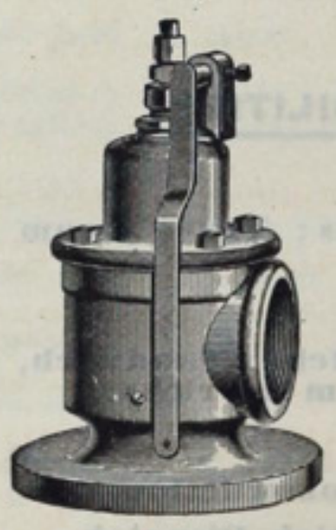

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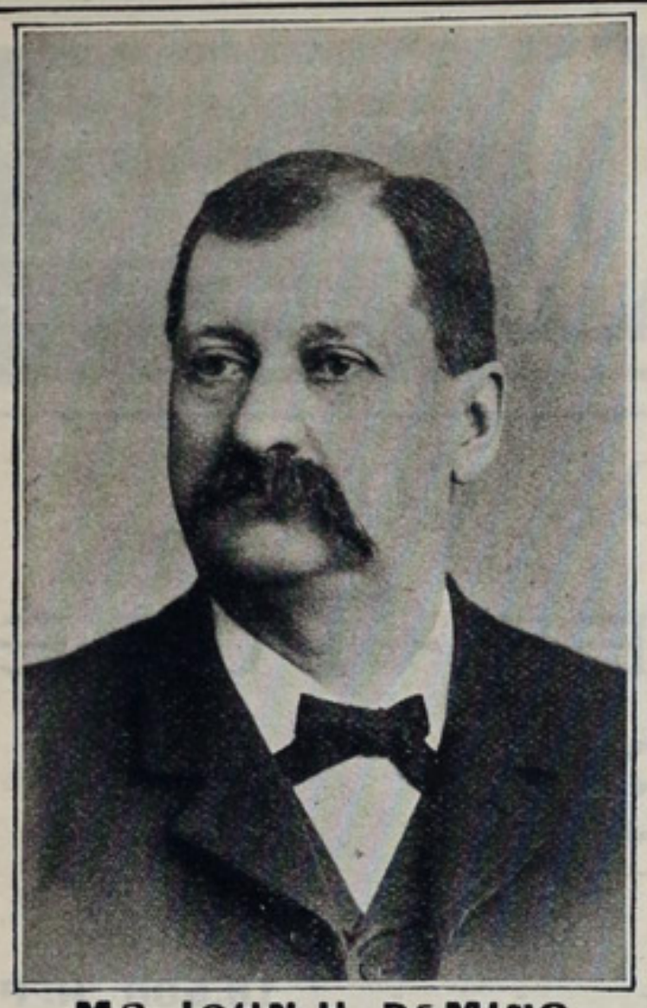

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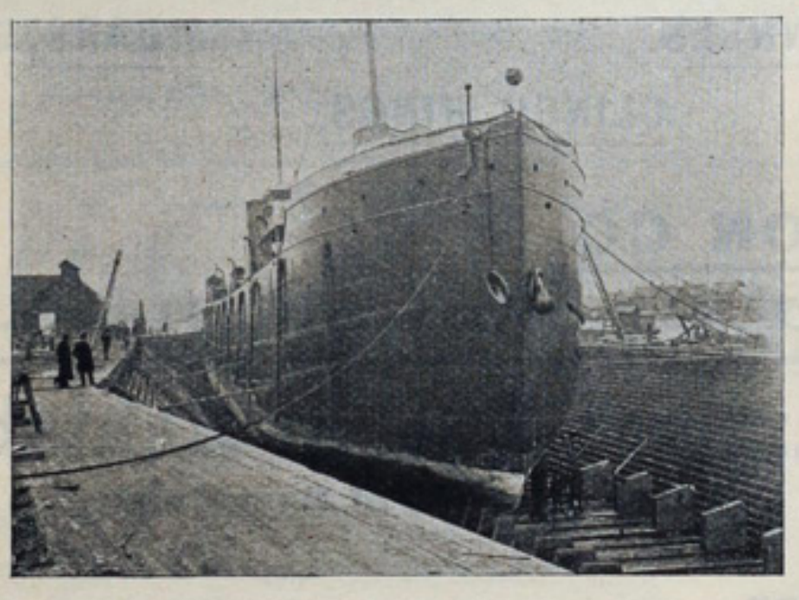
Plates & Material Always on hand to Repair all kinds of Metal Ships in Shortest Time.



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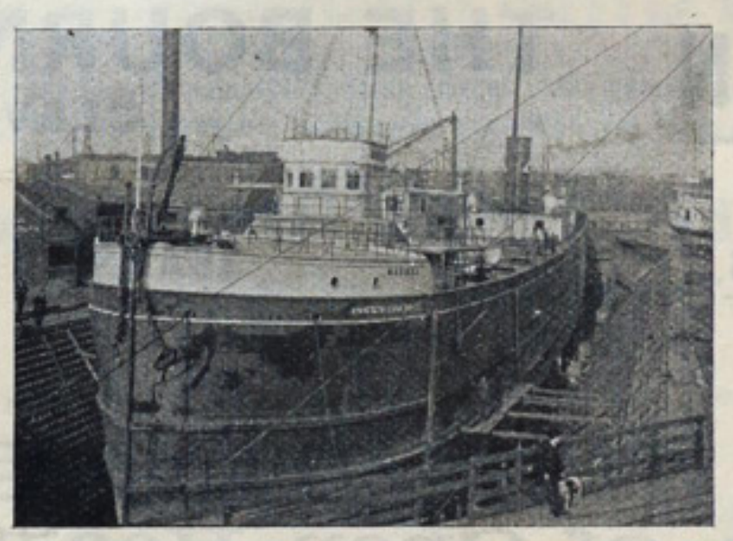

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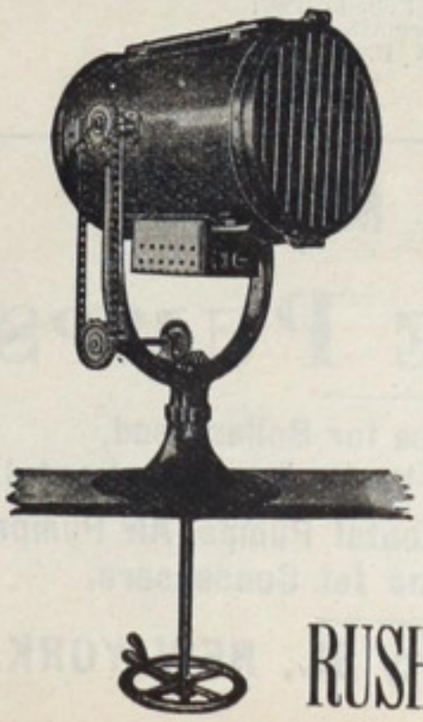

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